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Business Outlook Still Favorable

How Present Industrial Activity Confirms the Financial Indications of Six Months Ago—Advancing Prices Now an Unfavorable Sign

BY NATHANIEL R. WHITNEY*

As we near the end of the first half year, evidence is multiplying that the depression of 1920-1921 has been definitely left behind, and that business men may look forward confidently to continued betterment. Much of the improvement has been almost imperceptible while it was occurring, but a glance backward to the beginning of the year shows clearly the extent of the progress.

At the opening of the year the outlook was still somewhat clouded, although signs of clearer weather were apparent. It was generally understood that many insolvencies hung over the market, and it was feared that some very large failures among industrial corporations and banks might seriously impede recovery. However, the number of insolvent businesses has recently diminished and current failures are declining in magnitude. The danger of widespread bank failures has been definitely eliminated. Some of the largest industrial concerns engaged in automobile and tire production, which at the beginning of the year seemed to face inevitable bankruptcy, have been placed in a much more secure position by arrangements with their creditors and by improvement in their business.

Thousands of farmers who were in difficulties, and hundreds of bankers who were entangled with them, are able to breathe more easily now because of the improved demand for farm products and the lowered cost of producing these commodities. A construction program of tremendous magnitude has been begun. Large new issues of bonds at lower rates of interest and the trend of bond prices show an increasing supply of capital for long term uses, and the increased Federal reserve ratio which has been accompanied by a declining re-discount rate shows a considerable easing in the cost of short term borrowing.

Unemployment which was of staggering proportions has shrunk to a marked extent, and in certain districts complaint is already being heard of scarcity of labor. Production in several lines, such as iron and steel, oil, lumber and railroad equipment, has made giant strides. In recent weeks the indicated yield of the principal agricultural products has shown notable improvement.

Betterment of the European Situation

The European situation, which looked almost hopeless six months ago, now shows unmistakable signs of betterment. With the granting of a reparations moratorium to Germany and the possibility of a large foreign loan, the outlook is even brighter. The value of foreign monies as indicated by rates of exchange is increasing except for a few countries. Inspired by the example of Great Britain, definite steps are being taken by various European countries to restore the gold standard as quickly as possible. The disarmament conference in this country at the close of the preceding year, and the guarantees exchanged among the European nations at Genoa recently, will have the effect of reducing military and naval expenditures, so that a long step may be taken by some of these nations toward eliminating the chief item of their national expenditures. At any rate, there is greater hope that they may ultimately balance expenditures by receipts. All in all, noticeable progress has been made both in this country and abroad toward increased productivity and a restoration of prosperity. An attempt is made to summarize this progress graphically by means of the following charts.

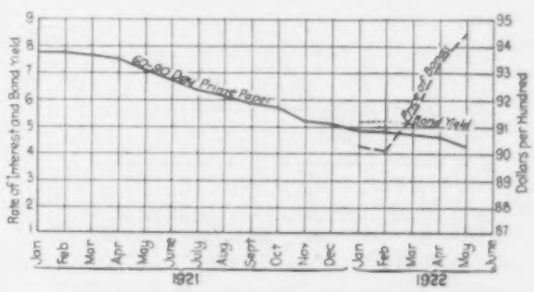

Chart 1—Monthly Average Rate on 60-90 Day Prime Two-Name Commercial Paper, Together with Average Interest Yield on Twenty High Grade Bonds and the Monthly Average Price of Such Bonds Since Jan. 1

Chart No. 1 shows the trend of the interest rate on prime commercial paper from Jan. 1, 1921, down to June 1 of this year. It illustrates also the course of the yield on high grade bonds as well as the price trend of these bonds. Twenty bonds, including government, municipal, public utility, railroad and industrial securities, were selected, and the prices were averaged for each month since the first of this year. It will be noted that the price of these bonds has been very noticeably rising and the interest yield both on these long term obligations and on the 60-90 day commercial paper has been declining since the first of the year. This shows something of the progress that has been

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made in providing capital, which is one of the prerequisites to industrial expansion.

Unfortunately figures for savings throughout the country are not available up to date, but the scattered returns from the various reserve districts as published in an article by the author in THE IRON AGE for May 25 indicates that the trend of savings is definitely upward. On May 31, 799 member banks reported to the Federal Reserve Board time deposits of $3,231,920,000. On the corresponding date a year ago 818 banks reported time deposits of only $2,935,578,000. Of course, the deposits to savings accounts by no means represent all the funds which are accumulated for investment. Increasingly large sums are being placed directly in securities rather than in banks. According to Bradstreet's, the sales of bonds for May and for the first five months

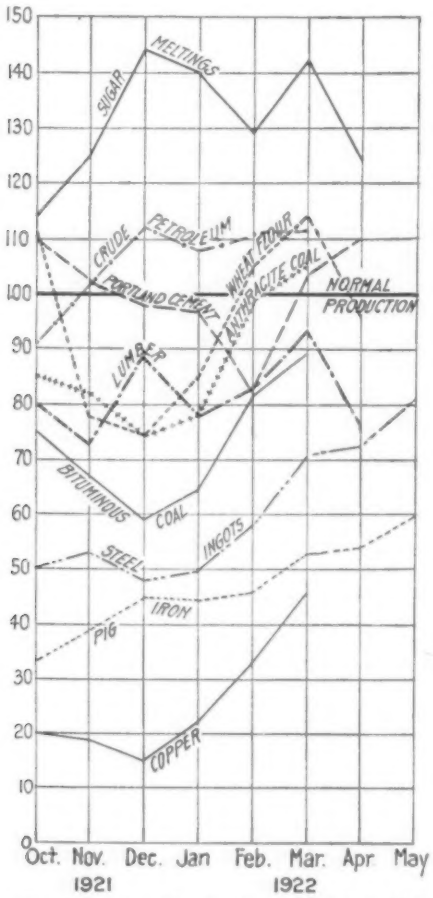


Chart 2—Monthly Production of Selected Commodities Expressed as Percentages of Estimated Normal Production

of each year for the past three years compare as follows. The figures relate to the par value of the bonds handled:

Comparative Sales of Bonds

	1922	1921	1920
May	$382,248,025	$230,953,700	$367,045,250
Five months	1,994,340,825	1,210,122,980	1,682,292,950

Not only have bonds been heavily purchased but large sales of stock have been made at rising prices. The figures recorded by Bradstreet's for shares sold are as follows:

Volume of Shares of Stock Sales

	1922	1921	1920
May	28,911,251	17,032,150	16,370,813
Five months	113,693,045	74,335,836	113,723,983

Although bond prices have been rising, and complaint has been made for a time that the chief difficulty confronting bond salesmen was to get sufficient bonds of an attractive nature to meet the demands of customers, the present situation of the market is one that might be characterized as quiet. Such huge issues have been floated that time is required for the investment market to digest them.

Liquidation of old loans has gone on in considerable volume; on May 31 of this year, 799 member banks reported total loans and discounts of $10,906,217,000 as compared with a total of $11,996,403,000 reported by 818 member banks on about the same date of last year. The Comptroller of the Currency recently announced that practically all of the banks throughout the country have now thawed out their frozen credits and that funds are available in ample amount for any projects that can justify their existence.

Further light is thrown on the subject of the liquidation of loans by the fact that on June 7, 1922, the total bill holdings of the Federal reserve banks amounted to $556,437,000 as compared with $1,965,860,000 on June 8, 1921. Federal reserve notes outstanding declined from $2,710,723,000 on June 8, 1921, to $2,141,531,000 on June 7, 1922. As loans and Federal reserve notes outstanding have declined, the ratio of gold and lawful money to Federal reserve notes and deposits of member banks combined has increased. In January, 1921, this averaged 48.1 per cent; in January, 1922, 76 per cent; on May 31, 78.0 per cent; and on June 7, 77.6 per cent.

Proved Forecasts of Six Months Ago

It has been reiterated by the writer that the financial indicators must register improvement before there can be any increase in industrial or commercial activity. At the beginning of the year financial data as analyzed in this journal forecast improving conditions, but there was comparatively little evidence of such improvement in industry at that time. Since then, however, considerable progress has been made. Some industries have developed more rapidly than others, but in most lines activity is very much more pronounced now than it was at the opening of the year.

Graph No. 2 illustrates this progress. The chart is based upon index numbers for the production of certain commodities as published in the New York Reserve Bank Monthly Review.

It will be noted that these figures are brought down in only two cases beyond the first of May. It is possible, however, to supplement them by evidence showing that the tendency to increased production continues in a number of these industries. According to a writer in a recent issue of THE IRON AGE: "The production of steel ingots for the entire country for the 27 steel making days of May appears to be 114,784 gross tons per day. This is at the rate of nearly 35,700,000 tons per annum, or nearly 82 per cent of the actual production of the year 1917. . . . May output, day for day, is nearly 64 per cent better than that of January." The indications are that this increased productivity in the steel industry will be maintained unless prevented by the coal strike. It is said that in spite of the growing steel output the pressure on mills is increasing. Demands for immediate delivery are piling up, and in some lines producers seem to be falling behind demands. In the face of the coal strike the Steel Corporation is said to be operating between 75 and 80 per cent of capacity.

The hopeful outlook for the iron and steel industry is illustrated in Graph No. 3, showing the unfilled orders of the United States Steel Corporation at various periods. In connection with this graph it is interesting to know that the largest total of unfilled orders on the books of the Steel Corporation was 12,183,083 tons on April 30, 1917. The smallest total was 2,605,747 tons on Dec. 31, 1910.

The following figures taken from a previous num-

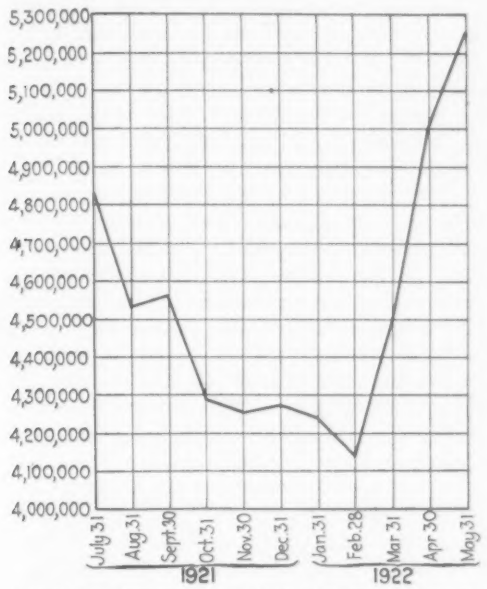


Chart 3—Tonnage of Unfilled Orders of United States Steel Corporation

ber of THE IRON AGE show the progress in the production of pig iron:

Monthly Production of Pig Iron

1921	Gross Tons	1922	Gross Tons
July	864,555	January	1,644,951
August	954,193	February	1,629,991
September	985,529	March	2,035,920
October	1,246,676	April	2,072,114
November	1,415,481	May	2,036,679
December	1,649,086		

Of course the coal strike has had a very serious effect on the total output of coal. The production of anthracite since the beginning of the strike has been practically nil. Surprising progress, on the other hand, seems to be made in getting out bituminous coal. During the tenth week of the strike soft coal production was 5,078,000 tons as compared with 4,616,000 tons in the previous week, and 8,010,000 tons in the week ending June 10, 1921. For the calendar year to date the output of soft coal is 172,192,000 tons as compared with 173,551,000 tons for the similar period last year.

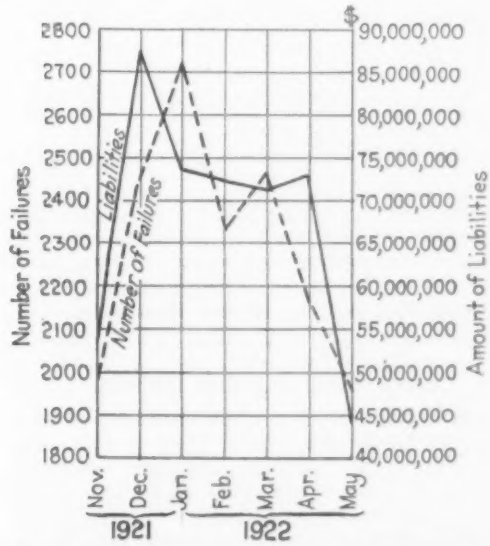


Chart 4—Number of Commercial Failures and Amount of Liabilities, by Months

Lumber producers also have been making great progress in increasing production. According to Bradstreet's, 347 reporting lumber mills produced in the week ended May 27, 207,830,204 board feet. Compared with the corresponding week in 1921, with 46 fewer mills reporting, there was a gain of 38,555,474 ft. The four chief softwood lumber groups reported production for the week ending May 27 on a basis of 99 per cent of normal. A comparison of production up to May 27 for the past two years is as follows:

1922	4,635,157,478 bd. ft.
1921	2,989,304,619 bd. ft.

The same causes which have stimulated the production of lumber have also furthered the production of Portland cement. For the first five months of the two years the number of barrels produced compares as follows:

Production of Portland Cement, in Barrels

	1921	1922
January	4,098,000	4,291,000
February	4,379,000	4,278,000
March	6,763,000	6,685,000
April	8,651,000	9,243,000
May	9,281,000	11,176,000

The building construction industry shows phenomenal gains. According to the reports of the F. W. Dodge Co., all previous records were broken in April and the May contracts exceeded the April total by about 3 per cent. For twenty-seven Northeastern States the value of the building contracts for May was 50 per cent greater than the figures for the corresponding month of last year. From Jan. 1 to June 1 the value of construction started was $1,352,965,000. This is the highest recorded figure for the first five months of any year. Up to June 1, the value of construction started was 61 per cent ahead of last year. A very large part of this is residence construction, and the reports show that the activity in the building line is distributed throughout practically all parts of the country.

The Obstacles of Strikes

Increase in the volume of production is dependent to a very considerable extent upon the supply of labor and upon the relations of employers with labor. The trend in the number of employed has been very noticeably upward, but strikes and threatened strikes still prevent that full co-operation which is essential for progress in production. The coal strike shows no signs of settlement, although there are rumors of possible conferences between the miners and operators. The public has been very apathetic in the matter because the warm weather and the industrial sluggishness, coupled with large reserves of coal, have prevented it from feeling the pinch thus far, but if the weather gets cooler and industrial demands quicken, these reserves will vanish and demand will then be tardily made that a settlement be effected. Although the anthracite working year is already well advanced, production is 15 million net tons short of the corresponding period of last year. It is simply added evidence of our individual and governmental short-sightedness in economic affairs that we permit one of our basic industries to continue so long in idleness when, if the public voice were raised with sufficient force, an equitable settlement could be brought about.

There is added now the menace of a strike among railroad workers in protest against wage reductions ordered by the Railroad Labor Board. It is asserted that an alliance is to be effected by the striking mine workers and ten organizations among the railroad workers who declare their intention of striking on July 1. In spite of these discouragements, however, industrial activity has been increasing and gives every indication of continuing to increase.

Graph No. 4, based upon Dun's figures, indicates that the trend of commercial failures is now downward. The total liabilities of failed concerns show a particularly sharp decrease during May. The May indebted-

ness is the smallest since last September, and is about 23 per cent below May, 1921.

These failures during May were distributed as follows:

Failures in May

	Number	Liabilities
Manufacturing concerns	508	$13,958,773
Trading concerns	1,377	25,446,464
Agents, brokers and miscellaneous	75	4,997,649

As a consequence of the improvement which has been registered in industry, we may look for increased activity in trading. The sales of mail order houses, which were at low ebb at the beginning of the year, have in the past two months shown signs of improvement. The five and ten cent stores and other chain stores have become very active, while in general retail establishments complaint is still made of dullness, though the sentiment among retailers is now more optimistic.

The increase in general commercial activity is indicated in the following table, which shows the average daily bank clearings for twenty cities, compiled by Dun:

Daily Bank Clearings (000 Omitted) in 20 Cities

	1922	1921	1920
January	$1,087,235	$1,190,774	$1,374,249
February	1,052,112	1,060,726	1,322,870
March	1,042,360	975,088	1,321,007
April	1,115,478	957,996	1,321,113
May	1,143,911	982,676	1,331,217
June (to 8th)	1,165,620	1,015,000	1,270,858

Chart No. 5, showing the course of wholesale prices from January, 1921, to date, is based upon Dun's index number.

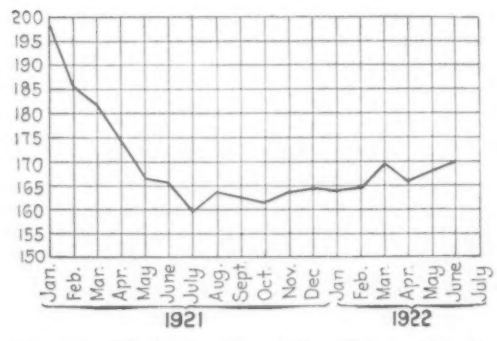


Chart 5—Wholesale Commodity Prices, Based on Dun's Index Number

It will be noted that the course of wholesale prices has been upward, with slight variations, almost continuously since July, 1921, when the index reached its low point. The total increase is slight, however, and is due chiefly to advances in metals, textiles and miscellaneous commodities.

Prosperity Not in Advancing Prices

It cannot be emphasized too strongly that the way to increased prosperity does not lie in the direction of advancing prices for commodities. Obviously if the prices for all commodities, including labor, starting from a normal base, should be advanced 100 per cent, no person would be any better off, since what he gained from selling his own commodities or services would be taken away through his purchases of the commodities and services furnished by others.

This truth is so self-evident that it would seem undeserving of comment if it were not for the constant evidence that many persons who think correctly in other respects cherish the vain hope that a return to business activity will be based upon and marked by a rise in the price level.

Recently a moderate rise in steel prices was widely heralded as a sign-post indicating progress toward general prosperity. The announcement that the price of woolens had been advanced was greeted by a financial writer in the following words: "Evidence of improved business conditions is to be found in the fact that the American Woolen Co. has advanced prices for its products." The truth of the matter is that except in the case of a few agricultural products any such tendency now represents a movement in the wrong direction. Costs and prices must be lowered to furnish a solid foundation for prosperity. An advance in prices, unless it is accompanied by a corresponding increase in general incomes—and there is no present evidence of any great increase in incomes—must ultimately cause a diminution in the buying of commodities. Buying might continue for a time in certain lines but it would be at the expense of other lines. No real or enduring prosperity can be obtained by promoting activity in some lines at the cost of prostration in others.

This popular delusion — that prosperity waits for rising prices—is traceable to selfishness and narrowness of vision in economic affairs. Each producer of commodities or services believes that his well-being is furthered by high prices for the things he sells. This may be true, provided other prices remain low. The laborer desires to see his wages high but wants the farmers' prices for foodstuffs low; the furniture manufacturer keeps his prices up but complains bitterly because laborers object to reduced wages. There is lacking the general acceptance of the fact that in the long run we all rise or fall together. An advancing price level at this time is an unfavorable rather than a favorable sign.

Cement Output a New Record

Production of Portland cement during May, 1922, reported by the United States Geological Survey, was 11,176,000 bbl., which is the largest amount ever produced in any single month. However, the outstanding feature of the situation is disclosed by the indicated movement of cement, May shipments being in excess of any preceding month. For the five months ending May 31 they were greater than during any similar period in past years, being more than 5,000,000 bbl. ahead of last year and nearly 4,000,000 bbl. in excess of 1920, which was the largest year for the industry.

	1922	1921
Production in Barrels:		
Month of May	11,176,000	9,287,000
Five months to May 31	35,763,000	33,172,000
Shipments in Barrels:		
Month of May	12,749,000	9,488,000
Five months to May 31	34,559,000	29,498,000
Stocks on Hand (Barrels):		
May 31	12,897,000	12,450,000

The great demand for Portland cement is attributed to the record breaking proportions of the building boom, which is under way, and to increased municipal improvements. The construction of concrete pavements is also an important factor, as the yardage under contract this year is greater than ever.

Drill Steel Survey Report

The first progress report to members of the advisory board to the Bureau of Mines and the Bureau of Standards on the breakage and heat treatment of rock drill steels and other steels and alloys subjected to similar impact stresses has been made by Dr. H. Foster Bain, director Bureau of Mines, and Dr. S. W. Stratton, director Bureau of Standards, covering the work done in the month of April.

The survey was begun on April 1 with the object of determining the present status of the types and sizes of drills as related to the heat treatment and breakage of rock drill steels. During that month a large number of mines, largely copper, were visited by F. B. Foley and H. S. Burnholz, metallurgists Bureau of Standards. The report, which is a lengthy one, gives the practice of each mine as to the kind of bit, the size of steel and in some cases the heat treatment used. No conclusions are drawn or comments made.

Properties of Arc Deposited Steel

Cast and Hammer Forged Metal Under Static and Dynamic Stress as Produced by Direct Current and Steel Electrodes

BY O. H. ESCHHOLZ*

A KNOWLEDGE of the properties of arc fused metal is of fundamental importance when considering the application of the metallic electrode welding process to the fabrication of strength members. In the following discussion some of the more important characteristics of this metal are considered when formed under the conditions of employing direct

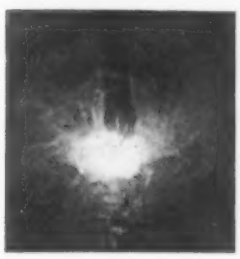


Fig. 1.—Appearance of Arc Stream and a Fusible Mild Steel Electrode When Holding a Short Arc. The globular enlargement of electrode preliminary to metal transfer is clearly visible

current, bare open-hearth steel electrodes having an approximate carbon content of 0.15 per cent and manganese of 0.5 per cent, and a skilled welder operating as part of an adequate welding organization. It should be recognized that somewhat different properties may be secured with the use of alternating currents, or bare or coated electrodes of other materials.

Cast Arc Metal

Metal deposition is accomplished chiefly by transferring numerous small liquid globules† rapidly from a fusible electrode to the liquified surface of the base or anode metal. The resulting deposit is but a special

Fig. 2.—Single Layer of Arc Deposited (Cast) Metal

form of casting, with the properties characteristic of cast metal modified by the inclusions of such impurities or faults as the process may admit.

During the operation of fusing, transferring and cooling, the electrode material is exposed to atmospheric gases so that a portion of the constituent elements are oxidized as indicated in the following table:

Table I—Analyses of Electrodes and Cast Metal

	Carbon, Per Cent	Manganese, Per Cent	Sulphur, Per Cent	Phosphorus Per Cent
Steel electrode....	0.16	0.56	0.024	0.032
Deposited metal..	0.05	0.19	0.013	0.024

The proportion of constituent elements removed by oxidation decreases as their content increases, owing to the formation of an arc envelope of oxidized material which serves to restrict the defusion rate of atmospheric oxygen to the incandescent metal. It has been noted by H. S. Rawdon,‡ that arc fused metal may have a nitrogen content of 0.14 per cent. While this may be regarded in general as undesirable, the effect of the presence of nitrogen on the mechanical properties of the cast metal has not been positively demonstrated.

Properties of Cast Metal in Static Stress

The average tensile properties of a number of standard 2-in. test pieces taken from large blocks of arc deposited metal, weighing from 7 to 14 lb., are given in Table II for various deposition procedures and directions of stress application.

Table II—Tensile Properties of Cast Arc Metal

	Lb. per Sq. In.			Per Cent		
	Tensile Strength	Yield Point	Elastic Limit	Elon. in 2 In.	Red. in Area	No. of Tests
A	56,800	34,630	28,250	17.4	27.3	3
B	51,375	29,050	24,000	14.1	18.8	1
C	42,180	29,125	22,125	4.6	11.4	2
D	56,737	38,000	31,750	7.8	16.6	2
E	51,550	34,450	27,250	9.5	9.0	4
F	54,110	34,030	27,810	12.2	17.9	
G	33,625	22,250	19,500	3.4	10.0	2

A—Stressed parallel to direction of deposition.
B—Stressed transverse to direction of deposition.
C—Stressed perpendicular to direction of deposition.
D—Stressed parallel to base, layers in alternate tiers deposited transversely.
E—Same as A, but tests made on small coupons by Bureau of Standards.
F—Average of A, B, D and E.
G—Metal deposited in bulk without following layer deposition procedure.

The importance of depositing metal in layer and not in bulk form is obvious from an inspection of this data. Some difference in the tensile properties of the cast

Fig. 3.—Fusion Pattern of Built-Up Layers Transverse to Direction of Deposition. (To facilitate photographing the fused zones, two types of electrodes were employed; the dark areas represent deposits from high carbon steel rods, the light areas deposits from mild carbon steel rods)

metal may be observed with change in the relation of stress and layer deposition direction. In most welds, however, the direction of applied stress is either parallel or transverse to that of the layers so that, for purposes of general discussion of approximate physical properties of cast metal, the values given for A, B, D and E, may be averaged as in F in Table II:

Resistance of Cast Metal to Compression, Shear, Etc.

The following data record the average results secured on metal deposited substantially as in procedures A, B, C and D, of Table II:

Compression—Elastic limit, 31,390 lb. per sq. in. (average of 5 tests).
Shear—Stress at shear, 39,700 lb. per sq. in. (average of 3 tests).
Cantilever—6-in. arm. Ultimate stress, 63,000 lb. per sq. in. (average of 3 tests).
Transverse—6 in. between supports. Elastic limit, 28,110 lb. per sq. in. (average of 3 tests).
Impact, Izod.—1.4 ft.-lb (average of 11 tests).
Brinell Hardness—No. 114.

Forged Arc Metal

The following is a summary of the conclusions formed from the results of a preliminary examination

*Material and process engineer, Westinghouse Electric & Mfg. Co., Pittsburgh; member of American Bureau of Welding.

†"Metal Deposition in Metallic Electrode Arc Welding," O. H. Eschholz, *Electrical World*, June 26, July 17, 1920.

‡"Properties of Arc Fused Steel," by H. S. Rawdon, physicist, U. S. Bureau of Standards, vol. III, *Proceedings* American Welding Society, 1921-22.

of the changes produced in cast arc metal by hammer forging:

Arc fused steel is forgeable from approximately 750 deg. C (1380 deg. Fahr.) to (1316 deg. C) (2400 deg. Fahr.).

The most pronounced improvement is secured upon forging an inferior grade of cast metal, high in slag inclusions, gas pockets and unfused zones.

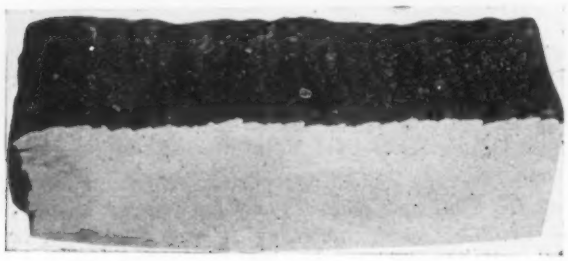


Fig. 4.—Section Through a 14-Lb. Block of Cast Arc Metal, Built Up by Depositing the Layers in Each Superposed Tier at Right Angles, the Surface of Each Tier Being Thoroughly Cleaned Before Applying the Next Tier. The average results of tensile tests on this metal reduced about one-half are given in D, Table II, and its fatigue performance in Table IV

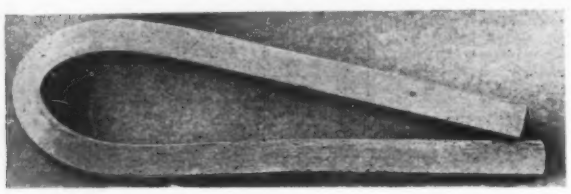
The average tensile properties secured on standard 2-in. test pieces taken from such inferior metal before and after forging at about 1200 deg. C are given in Table 3, while in Fig. 6 the corresponding characteristic square and cut fractures are shown.

Table III—Tensile Properties of Low Grade Arc Metal Before and After Hammer Forging

	Lb. per Sq. In.			Per Cent	
	Tensile Strength	Yield Point	Elastic Limit	Elon. in 2 In.	Red. in Area
A—Before ...	42,187	29,125	22,125	4.6	11.4
B—After	56,900	31,600	28,000	27.6	59.5

The forged material is stronger and more ductile than the cast metal.

The properties of the forging will obviously vary with the character of the mechanical work done and the finishing temperature. The average



Appearance of Bending Test Specimen Taken from a 7-Lb. Block of Cast Arc Metal Whose Tensile Properties Are Given in A, Table II

results of a series of tests on forged material compared with the average properties of cast metal from F, Table II, are recorded in Table IV.

Table IV—Tensile Properties of Forged Arc Metal Compared With Those of Cast Arc Metal

	Lb. per Sq. In.			Per Cent	
Finishing Temperature	Tensile Strength	Yield Point	Elastic Limit	Elon. in 2 In.	Red. in Area
		Forged Metal			
1150 deg. C.	58,790	31,435	23,000	33.9	61.0
900 deg. C.	57,200	34,725	29,500	34.9	61.3
750 deg. C.	62,175	50,000	44,500	31.3	50.0
		Cast Metal			
F, Table II	54,110	34,030	27,810	12.2	17.9

It will be noted that in all cases a decided improvement in ductility and ultimate tensile strength has been secured upon forging the cast metal. The elastic limit, however, may be greater or less than that of the cast metal depending somewhat upon the temperature at which the forging operation was completed.

Izod impact tests on forged metal gave about the same results, namely 1.5 foot pounds, as had been secured for the cast metal.

Dynamic Stress Resistance

From the known behavior of metals subject to varying stress the greater resistance of forged arc metal to fatigue stresses may be safely assumed. Since it is recognized that inclusions and irregularities of structure may serve as the beginning for the progressive spread of fractures, the fatigue performance of cast arc metal has been in considerable doubt.

To secure some conception of the comparative resistance to alternating stress of cast and forged arc metal as well as the usual boiler plate steel a short series of tests was made at a "nominal" fibre stress of 31,000 lb. per sq. in. in an Upton-Lewis fatigue testing machine. As the discrepancy between calculated and actual stress may be considerable in this type of test every precaution was taken to subject each specimen to the same conditions. The average number of cycles of reversals before fracture for each of three test pieces are given in Table V.

Table V—Accelerated Upton-Lewis Fatigue Tests on Cast and Forged Arc Metal

Material	Aver. No. of Stress Cycles
Base metal, mild carbon, open-hearth plate.....	26,175
Cast arc metal (F, Table II).....	8,611
Forged arc metal (finishing temp., 1150 deg. C.).	36,370
Forged arc metal (finishing temp., 900 deg. C.)...	44,781

This comparison greatly favors the forged arc metal. It will be noted that the forged arc metal is superior in fatigue resisting ability to the plate, while the cast arc metal is greatly inferior to the plate as

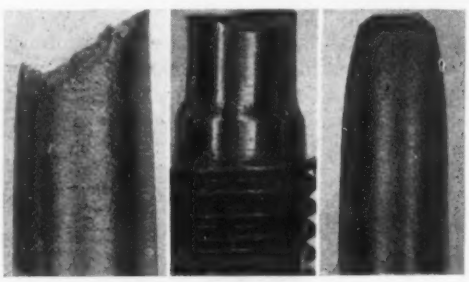


Fig. 6.—Characteristic Fractures of Arc Metal in Tension.

A. (Left)—Good grade of unannealed cast arc metal stressed parallel to direction of layer deposition—A, Table II.

B. (Center)—Square fracture secured in an inferior grade of cast arc metal as in C, Table II, and A, Table III.

C. (Right)—Excellent cup fracture secured upon forging the cast metal of the type shown in B of this figure. Tensile properties of the forged metal are recorded in Tables III and IV.

judged by this type of test. While accelerated tests are of some value conclusions from them must be drawn with care, particularly with respect to the performance of the weaker metal.

In view of the large amount of information secured during the investigation of the fatigue of metals at the University of Illinois by Prof. H. F. Moore and J. B. Kommers, published in Bulletin No. 124, when employing the Farmer type of rotating-beam machine, a comparison of the performance of cast arc metal under similar testing conditions was felt desirable. Because of limitations of testing facilities it has been possible to subject but one specimen of cast arc metal to test on the Farmer type machine. This specimen was cut from the body of the 14-lb. casting shown in Fig. 4, machined and finished in the same manner as the

standard rotating beam specimens employed by Prof. Moore. The diameter at the center of the span was 0.3005 in. The metal, while representative of a good grade of cast arc fused steel, was not entirely free from the usual small imperfections due to inclusions and overlaps. The tensile properties are given in D Table II.

In order that as much data as possible could be se-

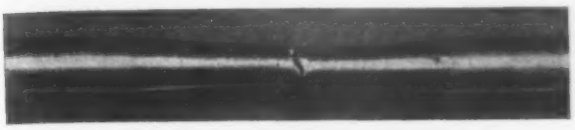


Fig. 7.—Appearance of Cast Arc Metal Fractured in the Farmer Type of Rotating Beam Fatigue Testing Machine. The performance under alternating stress is given in Table VI, "endurance" limit of 26,000 plus lb. per sq. in., and tensile properties are given in D, Table II. Note surface faults characteristic of cast arc metal

cured under the test limitations the somewhat irregular procedure was followed of increasing the stress after approximately each 2,000,000 cycles, with the exception of the run at 28,000 lb. per sq. in. which was shortened owing to the necessity of increasing the stress to secure early failure.

Table VI—Rotating Beam Machine Tests on a Single Specimen of Cast Arc Metal

Fiber Stress, Lb. per Sq. In.	Load, Lb.	No. of Stress Cycles without Fracture
20,000	13.315	1,967,000
22,500	14.979	2,174,000
24,000	15.978	2,165,600
26,000	17.309	2,170,000
28,000	18.641	443,000
30,000	19.972	*160,200
Total		9,079,800

*Fractured.

The appearance and performance of the stressed surface was normal after the run at 28,000 lb. fibre stress so that the "endurance limit" for this sample is estimated to be not less than 26,000 lb. per sq. in. While this result is better than had been expected, and is of the order of the "endurance limits" given by Professor Moore for Armco Iron (Moore test piece No. 9), cold drawn and hot roll steels (Moore test pieces Nos. 51 and 50), its chief value is a justification for a more optimistic attitude toward the performance and use of cast arc metal in structures subjected to stress variations of a low order of magnitude or of a slow period, as in tank cars and fired and non-fired pressure boilers.

The desirability of securing additional data on the performance of cast and forged arc metal under static and dynamic stress, particularly alternating impact, is evident. While this article assumes to give the average properties of metal deposited from only one type of electrode it is hoped the character of the result will serve to stimulate the investigation of numerous excellent and available electrode materials for which practically no equivalent performance data exists at the present time. The author wishes to acknowledge his indebtedness to Paul Orr and F. P. Lauffer for assistance in the preparation and test of the cast and forge metal.

W. A. Layman, president Wagner Electric Mfg. Co., St. Louis, has made the following statement to the Eighth Federal Reserve Bank in response to a questionnaire: "Rating our production of Jan. 1 as 100 per cent, our shipments for the year, including May, are as follows: February, 120 per cent; March, 156 per cent; April, 167 per cent; May, 217 per cent. Taking our employment figures as of Jan. 1 as 100 per cent, our present payroll is 190 per cent."

LABOR SHORTAGE GROWS

Immigration Ban a Large Factor—Higher Wage Scales Bring Out Some Men

In a statement by the National Industrial Conference Board, New York, attention is called to the increasing demand for labor at various points and the fact that this demand has overtaken the supply. Extracts follow:

"By the middle of April reports of labor shortage began to come from the Calumet region in Indiana. Here the lack of steel, metal and factory operatives were ascribed especially to the return of foreigners to their homelands, to the removal of others during the depression, and to the minimum wage scale of 28c. per hr., which was regarded as too low to draw out the desired labor. At about the same time an acute shortage of semi-skilled rolling-mill workers was reported in the Youngstown, Ohio, steel district. By the beginning of May, Milwaukee, Cleveland, Akron, Ohio, and Flint, Mich., began to report difficulties in securing an adequate labor supply. These difficulties were at first confined to factories, but later began to extend to building construction and other outdoor occupations.

"Generally, very little is being done in a constructive way to meet this labor shortage. In the building trades active steps are being taken and apprenticeship plans are being worked out. In a few factories emergency training courses are being installed but, on the whole, plants are using the expedient of increasing wages to draw out necessary labor. It is a striking fact that reports from a large number of heads of state labor departments state that if manufacturers would pay higher wages than now prevail, no difficulties in securing necessary help would be encountered.

One State commissioner of labor cites a shortage of labor when wages were at 18 to 20c. per hr., and a general easing when wages for common labor went to 30 to 35c. per hr. He states that present wages, which are close to 45c. per hr., are bringing out all necessary labor. It must be seen, however, that such a solution is only temporary and leaves the situation but little improved. The immediate result is rather a forcing up of the wage scale in other factories, with a necessity for further boosting of wages if the labor is to be retained. In some instances employers are trying to meet the situation by concerted advertising, and in a few cases by a frank recognition that efficiency must be increased.

"Practically no relief in the situation can be expected from an increased supply of labor through immigration. Whereas the annual increment through immigration in the five years preceding the war averaged 925,000, and fell to 668,712 during 1920-21, the total number admissible under the per centum limit act of May 19, 1921, was fixed at 355,825. Only about 232,000, however, actually entered during the year; as against this, 174,000 aliens left the country up to April 30. The Bureau of Immigration, in a revised statement of the number admissible, gives the total as 357,803 for the year 1922-23. It is quite likely that the number that will actually arrive will be somewhat larger than last year; it is likely also, however, that the full number admissible will not enter."

Cleveland Molders Strike

Union molders employed in most of the foundries making heavy castings in Cleveland have struck for an increase in wages from 62½c. to 75c. an hour. The reduction from the higher rate to the present rate was made Jan. 1 last. The foundries have offered a compromise scale of 70c. per hour, which the molders refuse to accept. Later two foundries granted the increase to 75c. and two others decided to close down temporarily. Four foundries, the City Foundry Co., the Kilby Mfg. Co., the Cleveland Steel Casting Co., and the Johnston & Jennings Co., have announced that they will not comply with the demand of the strikers and plan to resume operations on an open shop basis. The light gray iron foundries are not affected by the strike.

MACHINE-TOOL SITUATION

Ernest F. Du Brul Explains It to Railroad Men—Predicts Rising Costs

Ernest F. Du Brul, general manager of the National Machine Tool Builders' Association, in an address at the recent railroad convention at Atlantic City, N. J., told master mechanics that the purchasing authorities of the railroads are deceiving themselves as to the present machine-tool situation. He said:

"Many railroad master mechanics are telling the machine tool builders that they want a lot of tools for the railroad shops but that they are told by the purchasing authorities that the purchases will be held up until machine tool prices come lower than they are. I believe the purchasing authorities are deceiving themselves as to the present situation. The machine tool builder may likewise be deceiving himself, if he does not keep his eye on the labor situation, particularly as affecting the larger types of machines that are not now in stock and never are built for stock.

Labor Market as Affecting Output and Price

"The labor situation is such that if the market had a lot of orders right now, the machine tool builder could not find a sufficient supply of skilled labor of the sort necessary to build these tools. During the war, and for the year after the war, the machine tool builder did not train any general workmen—skilled all-around mechanics—so that as compared to the supply of this sort of labor in 1914 we have a deficiency.

"The reason is very obvious. During the war machine tool orders came in in much larger quantities than ever before. This prompted the machine tool builder to take men in and train them in special operations. He had neither the time nor the disposition to train a more general class of workmen, as he had done before the war. Demand from now on, dropping back to the smaller quantities that are more normal to the machine tool business, will require the general workman rather than the specialist.

"During the war the general machinist moved up the scale. He became a tool maker or he became a foreman, either in the machine tool shop or in some war industry shop, his place in production being taken by the specialist. Then, after the slump, these specialists went back to the farms or they are now engaged in the building industries, or elsewhere, and machine tool builders who are putting on more men, or trying to, find difficulty in getting these men back into the machine tool industry, which has been so deeply depressed for so long a period.

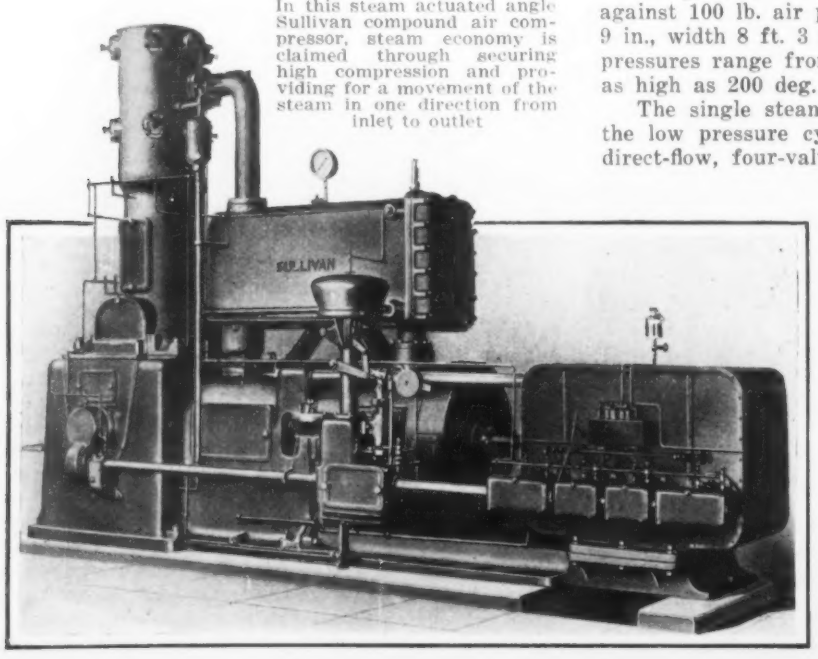
"To coax them back much higher wages will have to be paid to make up for the irregularity of employment, and to overcome their preference for the jobs they may now be filling. Not only that, but the heavy tools of course require much more general men, because they cannot be produced in quantities, as in the case of the lighter tools.

"The railroads need the tools right now, and it is short-sighted policy to defer the purchasing any longer, because as business picks up the available mechanical labor will be absorbed by the other industries and the bid the machine tool builder will have to make will have to be much higher. Such a policy of delay will merely concentrate the demand for machine shop labor at a later date, with the usual consequences, instead of spreading it out and making it easier all around. It is the early bird that will get the worm, as usual. The wise buyer, who now gets in his orders will not suffer either from delays in delivery or higher prices that are sure to follow, according to the present outlook on the labor market.

"Another point that must not be forgotten is that the restriction of immigration since the beginning of the war, and the consequent shortage in common labor that is evident in all sections of the country, even with the present amount of activity, is sure to create a demand for labor saving machinery of all kinds; and this of course means a demand for more machinists. At a period of intense activity—if the machine tool buyer waits too long—he will have the privilege of paying extremely high prices to induce production of machine tools, rather than in the present stage of the cycle."

New Sullivan Air Compressor

Cam-operated steam valves in the new angle compound steam driven air compressor now under test in the plant of the Sullivan Machinery Co. give direct steam flow from inlet to exhaust and by the use of a four-valved cylinder, two steam and two exhaust valves, serves to reduce to a very low factor the element of initial condensation. The compressor represents the application to the angle design of low and high pressure air cylinders of a steam end of high duty.



In this steam actuated angle Sullivan compound air compressor, steam economy is claimed through securing high compression and providing for a movement of the steam in one direction from inlet to outlet

The new type of compressor, which will be known as the class WD steam driven angle compound direct flow type, is to be manufactured in units of large capacity, the first unit to have a cylinder displacement of 1138 cu. ft. per min. Other sizes will run from 1730 up to 3500 cu. ft. per min. The 1138 ft. machine has a steam cylinder of 20-in. diameter and 14-in. stroke with air cylinders of 20-in. and 12-in. diameters respectively.

It operates at 225 r.p.m. and requires 190 hp. against 100 lb. air pressure. Overall length is 17 ft. 9 in., width 8 ft. 3 in. and height 10 ft. 8 in. Steam pressures range from 100 lb. to 200 lb.per sq. in. and as high as 200 deg. superheat can be used if desired.

The single steam cylinder, placed in tandem with the low pressure cylinder, is known as the Sullivan direct-flow, four-valve pattern. The cylinder casting contains the exhaust ports, placed near the bottom of the bore, and at some distance from the cylinder ends. The cylinder heads contain the steam ports, into which the steam valve cages are pressed. The entire head is utilized as a reservoir for the steam, so that the head temperature may be the same as that of the steam entering the cylinder.

The admission ports are placed at the bottom of the heads and extend below the bore of the cylinder sufficiently to permit any condensation, which may be entrapped after the exhaust valves have closed, to escape into the head.

Causes of Failures in Case-Hardening Steel

Non-Metallic Impurities, Chiefly Dissolved Oxides, Responsible in Many Cases in Which Hardening Process Has Been Thought at Fault

E. W. EHN, Canton, Ohio, was the author of a paper read at the May meeting of the Iron and Steel Institute in London, entitled "Influence of Dissolved Oxides on Carburizing and Hardening Qualities of Steel." The author's purpose was to show that certain steels, although fulfilling specifications as regards analysis and physical properties, are entirely unsuitable for re-carburizing. The paper deals mainly with steel of the following composition:

	Per Cent
Carbon	0.15 to 0.20
Manganese	0.35 to 0.65
Phosphorus, below	0.040
Sulphur, below	0.040
Silicon	0.005 to 0.010

Failures Not Due to Hardening Practice

The plant with which the author is connected is devoted to the manufacture of tapered roller bearings. In the hardening department of this plant it would occasionally happen, in spite of extreme care, that a large amount of carburized work failed to harden properly and had to be rejected, owing to the occurrence of soft troostitic spots. These failures were at first attributed to faulty carburizing or hardening practice, but after considerable research work it was definitely proved that the cause was some inherent property in the steel itself. The failures in the hardening were always traced to special lots, while other lots that had simultaneously undergone the same processes gave no trouble whatever. The author goes on to say:

The results obtained in commercial carburizing are very much dependent on the quality of the steel, and as these qualities cannot be determined by the usual chemical or physical test methods, the practical value of a carburizing test is obvious. A better product with uniform hardness, less operating trouble, and fewer rejections due to improper hardening, would be the ultimate result.

It is necessary for tests of this kind that microscopical examinations of carburized sections be made; but these do not, if properly conducted, involve a large amount of work, and after a little experience it becomes a very easy matter to determine from the carburized structure whether the steel is suitable for carburizing or not. Carburizing on a laboratory scale can be carried out in a few hours, especially if some kind of tight-fitting containers are employed in accordance with the recommendations made in the paper. It must be understood, however, that a test of one specimen from a large heat of open-hearth steel is not a perfect safeguard against improper steel, as different parts of a heat often show different carburizing qualities. Even one sample from each heat is, however, likely to catch the worst cases, and if several samples from each heat are tested, a reasonable security against improper steel should be obtained. Tests of this kind constitute, moreover, a distinct warning to the steel mills not to send their off heats to consumers who are known to submit the steel to tests of this kind.

Chromium Content Helps

For most carburizing purposes, a clean, well made, straight low-carbon steel (S.A.E. 1020) would be satisfactory, especially if hardened by spray quench to counteract small variations in the steel. Owing to the difficulty of obtaining a steel of this kind of uniform and proper quality in the open market, the author is inclined, however, to recommend for general carburizing purposes a steel with 0.30 to 0.50 per cent chromium. For parts subjected to a very severe service, steels with higher content of alloys such as chromium, nickel, and vanadium can be recommended, although for ordinary purposes out of the question owing to the higher price. A slight percentage of chromium, such as suggested, would give a steel of good carburizing properties, as it is very unusual to find a chromium steel with abnormal properties, would not raise the price very much, would rather help than impair the machining qualities, as straight S.A.E. 1020 steel often tears under the tools on account of being too soft, would increase the rate of penetration in the carburizing somewhat, would be beneficial for the hardening, and, last but not least, would necessitate carefully deoxidized heats, as otherwise so much chromium would be lost in the furnace that the chromium content in the finished steel is likely to be lower than specified, and thus detectable by chemical analysis.

The author finally calls attention to the important fact that the influence of oxides in steel is not restricted to carburized low-carbon steel. They will, if present, materially influence the results obtained in heat treating and hardening of any steel. In the paper, the probable influence on grain size and structure of work submitted to tough annealing operations, and on the spheroidizing of the cementite in annealing high-carbon steels are mentioned. It is an interesting fact that by carburizing high-carbon steels so as to obtain a carbon content of 1.10 per cent or over, a very sensitive test on the degree of deoxidation is obtained, and that in several instances it has been possible to prove by this method that failures in hardening were due to the presence of oxides in the steel. A well-deoxidized, high-carbon steel should give the structure described as normal in this paper, while abnormal properties are revealed mainly by irregular grain size. Figures in the paper show the edge of two carburized pieces of spring steel, the first of which was reported to have given excellent results in heat treating, while the results with the latter were erratic and irregular. The two steels were of approximately the same analysis, with the same physical properties, and with no difference in the microstructure before carburizing. Several similar instances could be given, with the results agreeing closely with the record of service for the different steels.

Many failures, especially in hardening, are likely to find their explanation on tests of this kind, and perhaps even the mysterious property of steel known as "body" might ultimately be explained by the presence or non-presence in the steel of non-metallic impurities, presumably oxides in solid colloidal solution.

The author summarizes his work as follows:

"1. Failure in case-hardening, especially as regards soft spots, is often due to improper steel. Variation of structure of a carburized piece gives a direct indication whether the steel is suitable for carburizing or not.

"2. Coarse-grained structure in case and core of carburized steel with large crystals of pearlite, and clean cut cementite areas in the hypereutectoid zone, are signs of good or 'normal' steel. Curly cementite, disintegration of pearlite in hypertutectoid zone, and fine-grain size with rounded pearlite areas in gradation zone and core are signs of an 'abnormal' steel. Abnormal steel has a tendency to give a thin case of high-carbon content and to form soft troostitic spots in hardening.

"3. Variation in structures obtained with normal and abnormal steel at different carburizing temperatures and rate of cooling is shown. Recommendations for carburizing tests on a laboratory scale are given.

"4. Proof is given that oxides uniformly distributed through the steel are the cause of the different carburizing properties. The ultimate reason is improper deoxidation of the steel when made, and no later treatment can change these properties.

"5. The influence of the oxides is explained theo-

retically. It is shown that the structure of the steel depends on the crystallization during the solidification of the steel in the ingot. A theory of the influence of oxides in hardening is given, founded on the work by Portevin and Garvin.

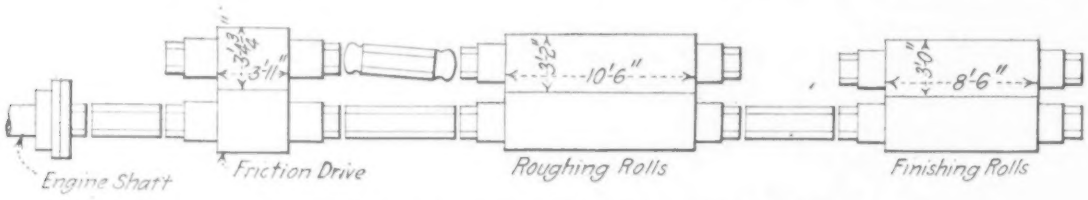
"6. Suggestions for new specifications for steel for ordinary carburizing purposes are given.

"7. It is shown that heat treatment of all kinds of steel is largely dependent on the presence in the steel of oxides."

Friction Drive for Rolling Mills*

A new form of driving arrangement for rolling mills has recently been patented and put into use by T. B. Rogerson, managing director James Dunlop & Co., Ltd., Glasgow, Scotland, owner of the Clyde Ironworks and the Calderbank Steel Works. The drive makes use of friction rollers instead of the ordinary gearing between the engine and the mill, and is especially suitable for plate and sheet mills, although no doubt it could be applied to other forms of mill if suitable arrangements could be made.

The example illustrated is at the Calderbank works; Messrs. Colville, of Motherwell, and Cockerill, of Seraing, have also installed this drive for one or more mills. The Calderbank works have previously attracted attention in the matter of driving rolling mills by virtue of the fact that one of its three-high plate mills is coupled through gearing to a Parsons steam turbine working normally on the exhaust from the blooming mill engine and the engine driving the two-high plate mill to which the friction drive is applied. In the event of the supply of exhaust steam being insufficient to maintain the speed of the turbine, a governor is arranged automatically to admit live steam from the boilers.



Friction Roller Drive Applied to Two-High Roughing Rol's

As applied to the two-high 38-in. reversing plate mill at Calderbank, the drive consists of two rollers about 4 ft. long, arranged one above the other in a suitable housing. The lower roller is connected to the engine shaft and to the lower roll of the mill. The upper roller is connected to the upper roll of the mill through a flexible shaft and simply rests with its own weight on top of its fellow.

These friction rollers may be made of cast iron or cast steel or may be formed from used-up mill rolls. They are turned with a finish similar to that given to ordinary mill rolls. That the friction between the rollers should be sufficient to drive the upper roll may appear surprising. It is, however, ample for the purpose, and by suitably choosing the length of the friction rollers it can be arranged that slipping shall not take place until the resistance to the drive rises approximately to a set abnormal value.

When the mill is being started up, and the lubricant in the journals is cold, it is sometimes necessary to increase the frictional grip of the rollers by throwing sand between them. Otherwise no assistance is required to prevent slipping in normal working. Should a jamb occur, the rollers will, of course, slip, and by so doing will avoid the breakage of the driving connections, which is the usual result of a jamb with ordinary gearing. The wear on the rollers after several months' use is found to be small.

In devising this form of drive, Mr. Rogerson was primarily aiming at the avoidance of delays caused by breakdowns. It has now, however, been established that, in addition to securing this object, there is a distinct saving in first cost in favor of the friction drive, as compared with the ordinary drive by means of cast or forged steel pinions, and that much less lubricant is required. Of still greater importance, however, is the fact, found by experience, that the adoption of the friction drive has increased the life of the mill rolls.

From figures relating to the lives of ten rolls operated by pinion drive and of nine rolls operated by Mr. Rogerson's friction drive, it is found that the best of the first-named broke after it had rolled 26,722 tons of material, while among the latter, one is returned as still being in use after having rolled 44,282 tons; another broke through wear and tear at 39,954 tons, and a third reached 39,450 tons without failing.

Even more significant perhaps are the figures relating to what were obviously defective rolls. Among the pinion-driven rolls one cracked in the center during the third shift at 1203 tons, and another broke through the neck at 4451 tons. Among the friction-driven rolls three were admitted by the makers to be defective by reason of faulty chilling. These three rolls are returned as still being in use after having rolled 29,053, 28,126 and 4052 tons.

As an example of the effectiveness of the drive in preventing serious damage, it may be said that on one occasion a 3-ton slab was being rolled down from 8 in. to ¾ in. in thickness, when a guard became caught between the plate and the rolls. Instead of the mill or engine or both being seriously damaged, as would almost certainly have occurred had the drive been of the usual pinion form, all that happened was that a delay of not more than two minutes occurred.

*Reprinted from *Engineer*, London.

Southern Metal Trades Meeting

ATLANTA, GA., June 22.—The fifth annual convention of the Southern Metal Trades Association was closed yesterday with a sea food dinner served at Tybee Island, Ga. A good showing was made in attendance, about 50 members being present. The following officers were elected:

President, J. H. Dore, Houston Car Wheel & Machine Co., Houston, Tex.

First vice-president, J. R. Hedges, Casey-Hedges Co., Chattanooga, Tenn.

Secretary, W. E. Dunn, Jr., Candler Building, Atlanta.

Treasurer, J. W. Moore, Atlanta Utility Works, East Point, Ga.

State vice-presidents, W. S. Pfohl, Briggs Shaffner Co., Winston-Salem, N. C.; T. H. Siddall, Sumter Machine Co., Sumter, S. C.; Jno. S. Schofield, Schofield's Sons Co., Macon, Ga.; J. M. Broom, Ocala Iron Works, Ocala, Fla.; E. W. McDonald, Talladega Foundry & Machine Co., Talladega, Ala.; E. F. Billington, Soule Steam Feed Works, Meridian, Miss.; T. L. La Malta, Chickasaw Machine & Foundry Co., Memphis, Tenn.; F. L. Dilley, Standard Brakeshoe & Foundry Co., Pine Bluff, Ark.; Chas. R. Law, DeSoto Foundry & Machine Co., Mansfield, La.; W. C. Trout, Lufkin Foundry & Machine Co., Lufkin, Tex.

Memphis, Tenn., was recommended for consideration of the administrative council for the next convention.

The Mahoning Valley Steel Co., Cleveland, was granted judgment in the sum of $22,363 against the A. J. Lindemann & Hoverson Co., stove and range manufacturers, Milwaukee, in the United States District Court at Milwaukee, in its suit to recover damages of $35,696 on allegations of breach of contract. The defendant corporation entered a counterclaim of $51,000 on similar grounds, which was denied.

Investigations of Proposed Steel Mergers

Department of Justice Finds No Reason to Take Action, but Is Open to Argument—Federal Trade Commission Still Busy

BY L. W. MOFFETT

WASHINGTON, June 27.—With the Department of Justice virtually completing its inquiry into the proposed mergers of the Bethlehem Steel Co. and the Lackawanna Steel Co. and the Midvale Steel & Ordnance Co., the Republic Iron & Steel Co. and the Inland Steel Co. and apparently finding no reason to take action to prevent consummation of the plans, the Federal Trade Commission at the same time is pressing its inquiry. The attitude of these two branches of the Government is strikingly different and it seems now that so far as the Department of Justice is concerned it is virtually done with its work in the case, except for making a report to the Senate in response to the LaFollette resolution. On the other hand, the Federal Trade Commission has broadened its inquiry in an effort to embrace every steel company in the United States in its investigation, although those proposing the mergers are the only ones directly involved by the LaFollette resolution. While these developments were under way, Representative Wood of Indiana, in an address to the House, upheld the proposed mergers.

Questions for All Companies

The Federal Trade Commission has received a response from the Midvale, Republic and Inland companies to its questionnaire and now is waiting a reply from the Bethlehem and Lackawanna companies, which is expected to be made in the near future. The commission, however, has not contented itself with sending these questionnaires to the companies which are proposing to merge, but has also sent them to all other steel companies in the country, so as to include the entire industry. It remains to be seen whether the companies not included in the merger plans will respond, and, if so, to what extent, to the questionnaire. At the offices of the commission, it was stated that the questionnaire is designed to get a picture of competition existing in the industry and the effect of the proposed mergers on that competition. This appears to be reaching to the basic point made in the complaint that the commission has issued against the Bethlehem and Lackawanna companies, whose consolidation, it is charged, would violate section five of the Federal Trade Commission act by constituting "an unfair method of competition, in that it contains a dangerous tendency unduly to hinder competition and to restrain trade and commerce and that a proceeding by the commission in this respect is in the public interest."

The commission has not as yet taken action regarding the proposed Midvale-Republic-Inland merger. It is believed the commission soon will make known whether or not a complaint will be issued in this case. The commission also has not as yet acted on the request of the Bethlehem and Lackawanna companies that the date for a hearing on the complaint issued against them, set for July 24, be advanced.

Replies Not Published

The commission has made public the questionnaire sent out, but has not made public the replies received and it is stated that it has not been decided whether the replies will be published unless they are incorporated in the hearings. The questionnaire calls upon the steel companies to advise the commission of the tonnage of specific products that they shipped annually to customers in the respective States of the United States and to foreign countries during the years 1919, 1920, and 1921.

The products dealt with include: Ingots, blooms, slabs, billets, sheet bars, rails, shapes, plates, bars, sheets, tubes, skelp, wire rods, drawn wire, tin plate, wire nails, and plain and fabricated structural material.

An Unusual Invitation

That the Department of Justice had exhausted its research regarding the mergers and found nothing illegal in them is indicated by the following invitation issued by the department to the public last Wednesday:

"In regard to two steel merger cases now before the Department of Justice it was announced today that the Department of Justice would be glad to hear from any dependable person who has any legitimate argument to offer against the mergers."

While the statement of the Department of Justice is construed to be rather unusual, because it generally relies upon its own agents to get information from the public or other sources, and does not directly seek public help through published announcements, the statement nevertheless is interpreted to mean that the department has given every possible chance to those who might oppose the merger to submit facts in substantiation of their position. By some the statement was seen as an answer to charges in and out of Congress that the department has been lukewarm regarding the investigation as to the proposed mergers and to other cases.

Open to Suggestions

The invitation apparently is intended to show that the department is open to any suggestions, criticisms, facts, etc., that may be submitted with respect to the mergers, but unless there is something forthcoming that so far the department has not learned, it seems to be extremely probable that it proposes to take no action against the steel companies and that the only thing that will remain for it to do will be to make a formal report to the Senate, pointing out what it had done in connection with its investigation and reporting that it found no reason to proceed against the steel companies. The Department of Justice was proceeding under the Sherman anti-trust law, while the Federal Trade Commission is proceeding under section five of the Federal Trade act.

Steel Companies Defended

Declaring that the steel industries of this country have been built up through a systematic combination of units and that without their help the allies would have lost the war before the United States entered it, Representative Wood of Indiana in a speech in the House last Friday upheld the proposed merger of independent steel companies. He asserted that they are trying to get into position to produce even more efficiently than now and are trying to eliminate waste, "avoidable by means proposed and not otherwise." He said that there is no doubt that the sober second thought of the people will favor the mergers. Mr. Wood praised the Steel Corporation for its efficiency, and fair conduct of business and also paid a tribute to Judge Gary for his broad vision and for his liberal policy toward labor. He said that a study of the Steel Coropration revealed beyond question that it is indeed "a corporation with a soul."

The Carnegie Steel Co., Pittsburgh, is bringing large quantities of scrap from its Mingo works, Mingo Junction, Ohio, to its plants in the Pittsburgh district, via the Ohio River in barges. Recently one shipment consisted of six barges loaded with about 3600 tons of scrap.

SALES MANAGEMENT IDEALS

Human Side of Industrial Engineering the Important Factor

BY NORVAL A. HAWKINS*

YOUR work has to do with increasing efficiency. If I were to ask just what you mean by efficiency you would with one accord define it as being "The ratio between energy expended and useful work done," and that's where I think you're wrong!

Applied to locomotives, engines and drill presses,—YES! But to man, with his hopes, his ideals, his heart and his soul—never! Efficiency is a human problem, always human, for without man, with his wants and his aspirations, all our machines of wealth and power fall into heaps of rust and ruin. Efficiency as an element in human progress is always measurable in the spirit and power of ideals. Human efficiency is the ratio between what I am and what I can and ought to be—between what I do and what I can and ought to do. As advocates of scientific management and devotees of industrial efficiency, you might do well to revise your definition.

No matter how completely a man has been instructed, or how ably he is directed, his efficiency depends upon the variable factor—his initiative power for change. He can ignore his instructions, and disobey or alter his directions. This difficult problem of management is tremendously complicated by the number of the men to be managed. A thousand men in an organization may make a hundred thousand changes in one working day without regard to efficiency or instructions.

Man cannot be compared to the inanimate. He cannot be reduced to mathematics. He is not a mere tool.

You can pick up a slide-rule at any time, without giving it a smile, and it will do its little job quickly, unquestioningly and without a grumble. Then you can throw it down and pay no more attention to it. You need show no special interest in its performance, or help it with encouragement or advice; and when its work does not bring the result you wanted, you can show all the temper you please. Above all, you never need to tell your slide-rule the reason why. It will work just as well for a bully, or a grouch, or a snob, as for a real man—but MEN WON'T.

All the industrial engineers I ever worked with commenced a new job by taking science and putting on the sharpest looks of keen impersonal analysis. And in my own experience I have never known a corps of engineers that included a sales manager as an important member. Every industrial engineering staff should have a corking good sales manager—not to talk over selling matters with the sales managers or purchasing agents of clients, but properly to market the industrial engineers' ideas in all departments of the business which are to be made more efficient by their introduction.

It is human nature to do a better job when the man you are doing it for is standing at your elbow. You should make the workman feel the presence of the buyer right in the shop when the goods are being made. Get him interested in the people who will buy the product. There is no better cure for inefficiency and indifference than arousing real heart interest in the work.

Extend the workman's interest and broaden his perspective, so that he will visualize the product in use, and make him feel that his work is a part of the actual service to the user. Teach him to think of the customer as his "boss"—the man who actually meets the payroll. Personalize the things that are being made. Inject a touch of human interest by telling the workman that he is the company's best salesman. Let him challenge your proofs and change his viewpoint by getting him to see things through a salesman's eyes.

The ordinary workman is antagonistic to industrial engineering simply because he thinks you are making him work harder and thus earn more profits for his employer. As long as the workman regards you in that light, he will oppose your efforts to improve his efficiency. You can compel him to obey, but, unless he is sold on the idea, your plan will not prove permanently efficient.

Show him the direct relation between the sales of the company and his steady job. Point out that his only competitor is a similar employee in a competing shop. Teach him how he can help himself to the retention of his job by helping to sell the product. Then and then only will he be stimulated by the enthusiasm of the real salesman. There is no employee who works so hard for his employer as the true salesman. He does not watch the clock. He is tireless. He will fight for his concern as whole-heartedly as he would battle for himself.

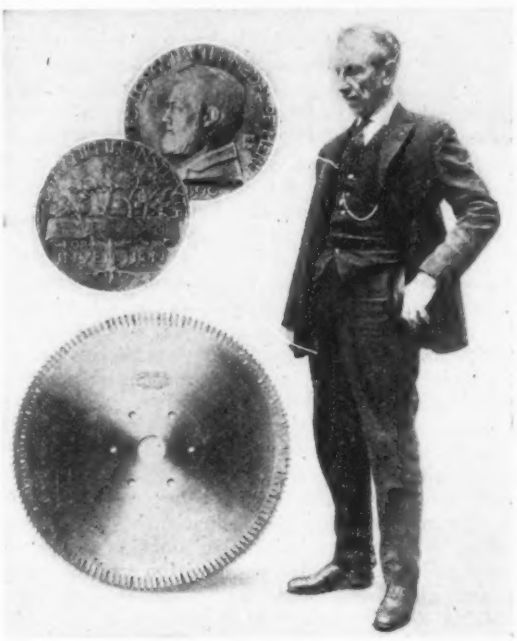
The salesman says "We," when he refers to the company. The ordinary workman says "They." So, as industrial engineers, your duty should be to change the defiant "They" into a co-operative "We."

*Director of sales advertising service, advisory staff, General Motors Corporation, in a paper before the Society of Industrial Engineers.

Medal Awarded Inventor of Metal Saw

Samuel T. Freas of Henry Disston Sons & Co., Inc., Philadelphia, inventor of the sectional interlocked inserted-tooth metal-cutting saw, has been awarded the Longstreth medal by the Franklin Institute of the State of Pennsylvania in recognition of his invention.

The presentation of the medal to Mr. Freas was made upon the recommendation of the institute's committee on science and the arts after a complete investigation. The report of the committee included photographs and drawings showing progressive steps in inventions of



this type of saw, since the inception of the idea about 30 years ago. In the findings of the committee, the practical merits of the saw were taken up, the report concluding with the following statement: "The results of this investigation indicate that the inventor was the first to fully realize the stresses developed in a metal cutting saw and to use this knowledge in inventing an inserted-tooth metal saw which operates effectively in the many uses to which it is applied, and has become a commercial success."

Mr. Freas has been associated with Henry Disston & Sons Co., Inc., for 21 years. The saw was designed and developed in the Disston factory and is manufactured as a standard product of that company. It is known to the trade in two different styles, the sectional-interlocked inserted-tooth metal-cutting saw and the interlocked metal-cutting saw. The former is used in cutting irregular shapes, steel rails, gates and risers for steel castings, the latter style being for cutting heavy work such as large steel forgings, etc.

SHEET STEEL SALES DROP

Operations and Shipments at Highest Rate in Association's History

Showing in graphic form conditions in the sheet trade, as existing in about 93 per cent of independent sheet capacity, but excluding the American Sheet & Tin Plate Co., a chart issued by the National Association of Sheet and Tin Plate Manufacturers, Oliver Building, Pittsburgh, and brought up to June 1, represents about 65 per cent of sheet capacity of the entire country. A similar chart showing conditions in the sheet industry up to May 1, was presented on page 1300, THE IRON AGE, issue of May 11. The tools against which these percentages are shown represent 439 hot mills, with a monthly capacity of 252,570 net tons. There are 641 hot mills in the United States, with a capacity of about 365,000 tons per month.

Unfilled orders on June 1 were a little more than 140 per cent of monthly capacity, compared with 160 per cent on May 1. Sales reported in May show a falling off of about 30 per cent as compared with April, this being largely due to the fact that the mills were pretty well filled up, and were getting conservative in the matter of taking on new business, owing to the uncertainty as to future costs. April sales were about 110 per cent of capacity, while in May they declined to a little less than 70 per cent of capacity. Sales have shown previously a steady increase since December, 1920.

Operations on June 1 were at about 85 per cent of capacity and shipments about the same. The highest previous rate of operations in sheet mills, members of the association, was in February, 1920, just before the railroad strike started, when about 84 per cent of the capacity was running. From that date on the rate of operations declined until July, 1920, when they started up again, and in October, 1920, reached 83 per cent of capacity. The lowest point in operations of the association sheet mills was reached in January, 1921, when only about 20 per cent was running. From that month on operations steadily increased, with a few slight dips, until May, 1922, when they reached an average of 83 per cent.

Figures submitted, under date of June 21, by the association to the Bureau of the Census, Washington, covering May, 1922, are as follows:

	Tons
Total sales of sheets for May	176,200
Total production	218,743
Total shipments	212,748
Unfilled tonnage, June 1	364,075
Finished stock on hand awaiting shipment	72,676
Sheets in stock unsold	22,177

Hot Weather Causes Loss in Production

YOUNGSTOWN, June 27.—Seasonal fluctuation in sheet mill operations due to inability to assemble full mill crews is cutting into production, a condition affecting all Valley independents. In hot mills, working conditions in the summer are such as to cause the lower-priced employees to seek work in other lines. This tendency becomes more pronounced when employment is on a stable basis and jobs are easily procured.

Consequently, in the summer many mill hands seek work in the open or in light manufacturing lines, complaining of the heat in the sheet mills. Sheet mill operators have been giving consideration lately to suggestions to counteract these influences and to prevent this seasonal turnover.

The lower-paid members of a crew, such as the matcher, pair heater, catcher and doubler, complain that their tonnage rates are not on a parity with the roller and his immediate helpers. Boss rollers on the heavy sheet mills are among the highest paid workmen in the steel industry. There has been some discussion to the effect that tonnage rates should be equalized and all members of a crew placed on a more equal footing. Under present conditions, the lower-priced workers are paid little more than semi-skilled employees, and many prefer to seek employment in the summer where working conditions are more agreeable.

Within the past few years, fewer Americans have been entering the mills, but this gap has been bridged by a larger number of foreign-born workmen taking their places.

Broad Plans Adopted by Construction Industry Organization

The American Construction Council was formally launched as a result of a two-day organization meeting held in Washington, June 19 and 20. The meeting was attended by about 170 representatives of the various groups concerned with construction. The following were adopted as the lines of activity to be undertaken by the council: (1) The formation of a code of ethics acceptable to the whole industry and to the public; (2) gathering of adequate statistics from all sources; (3) reduction of the national shortage of building trade mechanics and the establishment of the necessary apprenticeship system; (4) co-operation in establishing uniform building codes throughout the country; (5) co-operation with railways in expediting the revision of existing freight rates on construction materials; (6) the establishing and strengthening of local organizations throughout the country to bring about the co-operation of all elements in conformity with the principles of the council; (7) the investigation of the evils of seasonal employment and migration of labor; (8) the encouragement of local building shows; (9) simplification and the elimination of waste; (10) education of the public as to the desirability of a better distribution of its construction and maintenance requirements; (11) promotion of health and safety for workmen and the reduction of loss of life; (12) the reduction of waste of construction materials from preventable fires; (13) the study of old buildings in order to establish superior methods of construction; (14) the education of the public as to the necessity and economy of properly maintaining structures.

Penn Seaboard and Carpenter Steel Co. to Consolidate

As forecasted in THE IRON AGE of June 15, page 1702, a merger of the Penn Seaboard Steel Corporation, Philadelphia, and the Carpenter Steel Co., Reading, Pa., will probably be consummated at a meeting of stockholders on July 7. The directors have voted favorably upon the merger. The Carpenter Steel Co. specializes in tool steels, while the Penn Seaboard Steel Corporation has facilities for the production of alloy steel ingots and billets. Upon completion of the merger, it is the intention to use the name Carpenter Steel Co. for the consolidated company.

Stockholders of the Penn Seaboard Steel Corporation will be asked to authorize the issuance of $5,000,000 first mortgage 7 per cent 20-year gold bonds and 250,000 shares of class A common stock, the proceeds of which will be used to purchase the properties of the Carpenter Steel Co., to retire funded indebtedness of the Penn Seaboard Steel Corporation and to establish a reserve fund.

Pilling & Co. to Handle Stephenson Charcoal Pig Iron

The Stephenson Charcoal Co., Wells, Mich., manufacturer of warm blast charcoal pig iron, has appointed Pilling & Co. its exclusive selling agents in New England and New Jersey, with selling rights also in the remainder of the Eastern territory. Pilling & Co. have offices at 2 Rector Street, New York, and Real Estate Trust Building, Philadelphia.

French Production of Pig Iron and Steel

PARIS, FRANCE, June 16.—Official figures just given out here show the production of pig iron and steel (ingots and castings) for first four months of 1922, as follows:

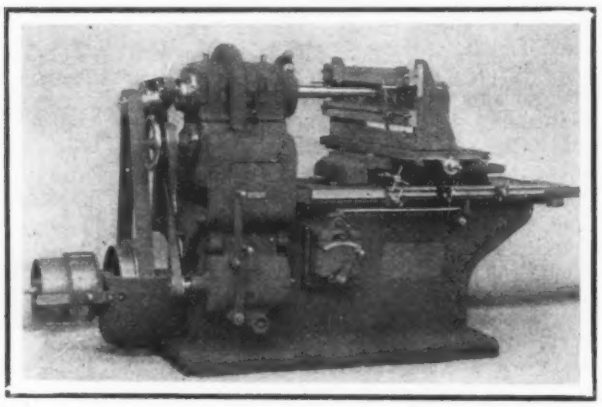
	Pig Iron (Tons)	Steel (Tons)
January	311,815	314,598
February	318,294	316,705
March	384,885	366,951
April	383,266	324,350

New Machine for Grinding Cylinders

A machine designed especially for grinding automobile cylinders, but a manufacturing tool as well, is being placed on the market by the Heald Machine Co., Worcester. It is designated as style No. 50 and has features not before applied to a grinder of this kind.

One of the outstanding features is the simple hydraulic drive arrangement for the main table, which is operated by oil and permits obtaining instantly any speed from nothing up to the maximum. With the speed under close control it is possible to secure an extremely fine finish, and the table can be reversed at any desired point without shock or noise. The drive is silent and there are no parts to get out of order.

The cross slide table is 43¾ in. long by 16¾ in. wide, and has a finished top 38 in. long by 12¾ in. wide



Cylinder Grinder with Universal Jig. The jig will handle all sizes and styles of blocs

equipped with two T-slots. It gives crosswise adjustments of 28 in. to the work. The feed screw has a graduated dial reading to thousandths of an inch. Adjustable dogs are provided for indicating large dimensions such as when travelling from hole to hole. Exact distances are obtained by a micrometer dial, from the cross feed screw, which can be set at zero for the first hole, and position of the dial noted for other holes.

A vertical adjustment of the cross slide table of 5/16 in. can be secured by two inclined slides located between the cross slide and the main tables. By turning a small pilot wheel connected by gear with a screw, the upper inclined slide is moved in a direction parallel to the main table. The upper inclined slide moving up and down on the lower inclined surface raises and lowers the cross slide table and work.

When a large variety of work is to be handled, a universal jig as shown in the illustration, having a capacity of 38 in. can be furnished, which locates the hole for the grinding center. Inasmuch as only a slight vertical adjustment is required to obtain the exact position or to take care of any vertical errors existing in different bores in a cylinder casting, 5/16 in. is ample. If the work is of such size that there is not sufficient distance between the grinding center of the eccentric and the top of the cross slide table, all slides and the cross slide table can be removed and the work strapped directly on the main table. A connection between the top inclined slide and the main table keeps the position of the grinding wheel relative to the work, regardless of vertical adjustment.

The grinding head and feeding arrangement for the eccentric are similar in design to those previously employed by the company on other machines, but the head spindle is a little heavier. The locating head is made up of two eccentrics, one within the other, giving the grinding spindle proper adjustment for accurately feeding the wheel to the work. The eccentric has three speeds, controlled by a lever.

The grinding spindle is driven from the main drive shaft through a flexible idler maintaining uniform belt tension. The tight and loose pulleys are 12 by 5 in. and run at 750 r.p.m. The spindle is hardened and ground and runs in a solid taper bronze bearing at the wheel end, with a self-alining ball bearing at the pulley end. It is fitted with interchangeable pulleys, to give different grinding wheel speeds. The wheel spindle regularly provided is for holes 2⅜ in. dia. and larger by 11 in. long, also 3 in. dia. and larger by 18 in. long. Wheel spindles of different sizes and capacity are available.

The depth cut is obtained by a feed mechanism on the right-hand end of the rotating head, which is operated by a knob for small adjustments and by a crank for large. Standard grinding wheels for the regularly furnished spindle are 2¾ in. and 3½ in. diameter, with surface speeds of 4950 to 5000 ft. per min.

The main casting of the machine is a solid bed, unusually massive and made to accommodate any size of bloc without any undue overhang on either side. Fully equipped the machine weighs 5000 lb. and occupies 73 by 123 in. floor space. A 5 hp., 1000 to 1200 r.p.m. motor is recommended.

Industrial Truck Equipped with Crane

The Elwell-Parker Electric Co., Cleveland, has added to its line the new electrically operated industrial truck equipped with a crane, shown in the accompanying illustration. It is said to approach in capacity the gas or steam locomotive crane. The new unit has a low, revolving and luffing electric crane, mounted on an electric load carrying truck. It is pointed out that because of its size and flexibility, it is especially suited for inside work although it may be used for outdoor service as well.

The truck has a 12-ft. boom and a lifting capacity of 3000 lb. at 6 ft. and 1000 lb. at 12 ft. radius without outriggers. The truck itself is a new design of very heavy construction to provide stability and to withstand the strains imposed when lifting. It is stated that this assures satisfactory performance when carrying a 3000-lb. load, the weight of the load and truck being 8500 to 9000 lb.

A single motor double-drum hoist of a new design handles a separate line to the boom and hook, the motor hoist unit with the battery in its compartment forming

Two Motors Are Employed, One for Propelling and One for Hoisting. Both are supplied by a single battery

a counterbalance for the loaded boom. The crane column is supported on a heavy board pillar and revolves on large ball and roller bearings, and the geared revolving or slewing device provided swings the crane through 180 deg. The boom may be raised or lowered or swung to the right or left and locked at any desired position. With the boom lowered it is 6 ft. high.

Two motors are employed, one for propelling and the other for hoisting, both supplied by a single battery. The power cables are carried through the crane column in order to avoid swinging or twisting. The truck has wide spread traveling and trailing axles and solid rubber 22 x 4½-in. and 15 x 3½-in. tires. Various safety and other features include automatic control, crane trip switch, worm drive, four wheel steer and a pressure lubricating system.

MARKED IMPROVEMENT

Many Industries in Pennsylvania Show Increased Activity

HARRISBURG, PA., June 28.—Iron and steel conditions in Pennsylvania showed decided improvement in the period May 15-June 15, according to a report issued by Clifford B. Connelley, commissioner of the Pennsylvania State Department of Labor and Industry. Iron and steel workers without employment were 49,075 on May 15 and 33,250 on June 15.

Nine of the ten employment districts of Pennsylvania reported conditions improved. Philadelphia had 20,000 out of work on June 15 as compared with 30,000 on May 15. The single district reporting more unemployed, New Kensington, had 1000 without work on June 15 as compared to 600 on May 15.

The unemployed in the metal and machinery trades, by districts, on May 15 and June 15 follow:

	May 15	June 15
Altoona	975	700
Erie	3,800	1,900
Johnstown	2,000	500
McKeesport	1,200	900
New Kensington	600	1,000
Philadelphia	30,000	20,000
Harrisburg	1,800	1,400
Pittsburgh	4,500	3,000
Scranton	4,000	3,700
Williamsport	200	150
Totals	49,075	33,250

Philadelphia reports that there has been good demand from both within and without the district for first-class mechanics and machine operators. This is particularly true, the report says, of automobile manufacturers from Ohio and New York State.

Harrisburg reports that nearly all metal and machinery plants are operating at full capacity, and, with a few exceptions of various classes of men, there is a demand. Labor agents and scouts are again reported to be on the road soliciting help for metal working and machinery industries. Requests are received for templet makers, furnace men, bricklayers, molders, and coremakers, and a shortage is reported in all these classes.

Altoona reports that machine shops of the Pennsylvania Railroad at South Altoona, East Altoona, Juniata and Altoona proper have gone back to the 48-hr. week schedule, and have taken on additional men. The Altoona Iron Works is reported to have resumed operations after an idleness of almost a year.

Erie industries are said in the report to be operating at 70 per cent normal capacity, an increase of 3 per cent over May 1. The surplus of machinists has been decreased considerably by men taking employment in Detroit and Akron. The demand is equal to the supply for patternmakers, polishers, welders and bench molders. There is a surplus of machinists, machine operators, tool makers and floor molders.

Johnstown mills are operating at 75 per cent capacity, and sufficient orders are on hand to operate at 85 per cent capacity, according to the report. No effort is to be made to reach the latter capacity of operation because of the coal strike.

McKeesport says there has been a slight demand for skilled labor. One of the New Kensington tin mills is reported to have closed indefinitely, but representatives from other districts have sought skilled and semi-skilled labor in the district.

In the Pittsburgh territory there has been increased demand for virtually all branches of the industry.

Scranton says that approximately 500 men have been re-engaged in locomotive and repair shops of the district, and that the Lackawanna shops have been assured that within a short time all its men will be back at their places. Continued improvement is reported in Williamsport, and virtually all iron and steel workers have been placed.

Youngstown Plant Activities

YOUNGSTOWN, June 27.—The Republic Iron & Steel Co. has blown in the third blast furnace in its Haselton group, likely to be followed by resumption of its Bessemer department. Valley ingot capacity is being operated at fully 85 per cent. Of the 47 blast furnaces in the district, only the largest and most efficient stacks are pouring.

Since June 15, when lower freight rates became effective on ore, there has been an appreciable increase in the ore movement from lake ports to furnace yards. The daily average loaded car movement on the Ohio Region of the Erie Railroad in June is 4400, comparing with 4100 in May and 3700 in June a year ago.

There has been some slackening in shipments of iron and steel products, as consumers not in urgent need of material have requested holdups in consignments until July 1, when the 10 per cent reduction in freight rates becomes effective. June loaded car movement for the district averages about 10 per cent higher than in May and from 15 to 20 per cent above the per diem average in June, 1921.

Youngstown District Operations

YOUNGSTOWN, OHIO, June 27.—Relighting of the Mary blast furnace at Lowellville of the Sharon Steel Hoop Co. will bring the total number of active furnaces in the Mahoning Valley to 16 out of a total of 26. The company has covered on its coke requirements with a producer of by-product coke. For the district embracing the Shenango and Mahoning Valleys, 23 of 47 furnaces are active pouring, representing 75 per cent of iron capacity.

The following approximate percentage averages are being maintained in operations: Youngstown Sheet & Tube Co., 90 per cent; Trumbull Steel Co., 95 per cent; Republic Iron & Steel Co., 65 per cent; Carnegie Steel Co. plants in Youngstown district, 90 per cent; Brier Hill Steel Co., 90 per cent; Sharon Steel Hoop Co., 80 per cent; A. M. Byers Co., 50 per cent at Girard works.

Puddle mills of the Byers company at Girard are being scheduled on a basis of two turns of five heats each per day, to satisfy muck mill rollers who objected to schedules heretofore in effect because of inadequate compensation.

The Sheet & Tube company has been operating nine tube mills and the Republic five, a total of 14 out of 17. Skelp production is close to normal, strip departments are running at 80 per cent, and other finishing capacity, with exception of plate, at about the same rate. The Brier Hill company has been restricting its plate business to 84-in. mill size. Sheet mill production averages close to a normal rate.

A number of Valley units built during the war and owned by the Government are inactive, including a universal plate mill and two open-hearth furnaces. Negotiations looking toward their resumption have been undertaken.

New Steel Car Plant

The Greenville Steel Car Co., Greenville, Pa., which heretofore has confined its production to the rebuilding of steel cars, has decided to go into the manufacture of new steel cars. The company has started an addition to its plant for this purpose, the new building to be 75 ft. wide by 360 ft. long, equipped with modern steel car fabricating machinery. The company expects to have a capacity for 20 new steel cars per day, in addition to its regular repair car output. The construction work is being done by its own forces.

The Columbia Nut & Bolt Co., Bridgeport, Conn., reports May sales as 60 per cent larger than those for the corresponding month last year. June figures, while not available, indicate a healthy expansion in business. The company recently put into effect a slight advance in prices.

Steel Castings Prices Are Advanced

Improvement in Market Reflected in Revision of Discounts—Half of Items Marked Up 5 Per Cent—Others Unchanged

AS forecast in the steel castings paragraph of the Chicago iron and steel market of last week, the growing firmness in the steel castings market has been reflected in a general revision of discounts. New discounts announced by the American Steel Foundries, as effective July 1, represent an average advance of 5 per cent for approximately 50 per cent of the items listed. Discounts on the remainder are unchanged. The last complete list of discounts announced by this company became effective April 1 and a minor change, an advance in freight car miscellaneous castings, went into effect May 15. It is the opinion of the trade that further advances in castings will be made from time to time for some months to come. The list prices published below are identical with those of April 1 with two exceptions. The extra to be added to the net prices for 0.18 per cent vanadium is now $2.80 per 100 lb. instead of $2.95, and the extra for 1 per cent chrome and 0.18 per cent vanadium is $3.80 instead of $3.95.

List Prices for Steel Castings

Covering steel castings produced in accordance with the requirements of American Society for Testing Materials standard specifications for steel castings.

Division of Weight:	Per 100 Lb.
Over 1 to 10 lb	$23.00
Over 10 to 25 lb	20.20
Over 25 to 50 lb	15.90
Over 50 to 100 lb	12.80
Over 100 to 250 lb	11.80
Over 250 to 500 lb	10.85
Over 500 to 1,000 lb	9.75
Over 1,000 to 2,500 lb	9.05
Over 2,500 to 5,000 lb	8.75
Over 5,000 to 10,000 lb	8.40
Over 10,000 to 50,000 lb	8.15
Over 50,000 lb	9.50

Extras to Be Added to Net Prices:	Add Per 100 Lb.
For carbon 0.50 to 0.70	$0.25
For carbon 0.70 to 1.00	.50
For carbon 1.00 to 1.25	.75
For carbon 1.25 to 1.50	1.00
For carbon 1.50 and over	1.75
For 2½ to 3½ per cent nickel	2.75
For 0.18 vanadium	2.80
For 1 per cent chrome	1.00
For 1 per cent chrome and 2 per cent nickel	2.50
For 1 per cent chrome and 0.18 vanadium	3.80
For steam test on any casting	.25
For all castings with water circulating pipes	20 per cent

Freight Allowance

The prices obtained after applying the discounts cover the castings in the rough, f.o.b. our works, with published rate of freight allowed to the freight station of purchaser, other than railroads, located within a line drawn from Boston, through Schenectady, Rochester and Niagara Falls, N. Y., Detroit, Duluth, Minn., St. Louis, Cincinnati, Washington, Cape May, N. J., and other Atlantic Ocean terminal points between Cape May and Boston. Prices to railroads are f.o.b. our works, with published rate of freight allowed to nearest point on the line of their road located in the territory mentioned above. For deliveries outside of the territory mentioned, on shipments to all purchasers, freight will be allowed only to the boundary line; the excess to be paid by the purchaser.

Discounts as of July 1, 1922, Are as Follows:

Name of Casting:	Discount, Per Cent
Accumulator cylinders:	
With walls over 1½ in. thick and simple flange on one end	17½
With walls 1½ in. thick or less and simple flange on one end	7½
All other designs	Net
Ammonia fittings	10
Annealing bottoms	57½
Annealing boxes	40
Annealing pots	40
Anode plates	60
Anvil blocks	50
Arms for boiler riveters	10
Ball and socket joints	25
Bars, grizzly	42½
Bases, column:	
In lots of 1 to 49 pieces	52½
In lots of 50 and over	57½
Bells for blast furnaces	37½
Blades, propeller	20
Blast furnace bells	37½
Blast furnace miscellaneous	45
Blocks, anvil	50
Blocks, bridge:	
In lots of 1 to 49 pieces	52½
In lots of 50 and over	57½
Blocks, die	47½
Bodies, valve	25
Boiler riveter arms	10
Boiler saddles	25
Bolster center fillers:	
In lots of 1 to 49 pieces	35
In lots of 50 to 99 pieces	40
In lots of 100 to 249 pieces	45
In lots of 250 to 499 pieces	50
In lots of 500 and over	55
Bosh plates	47½
Bottom plates, refractory	32½
Bottoms, annealing	57½
Boxes, annealing	40
Boxes, charging	47½
Boxes, coupling	50
Boxes, journal	*
Brackets, guide	7½
Brake wheels, crane	7½
Bridge blocks:	
In lots of 1 to 49 pieces	52½
In lots of 50 and over	57½
Bridge shoes:	
In lots of 1 to 49 pieces	52½
In lots of 50 and over	57½
Bumper hoods, crane	7½
Bumpers for mine cars:	
In lots of 1 to 49 pieces	37½
In lots of 50 to 99 pieces	42½
In lots of 100 to 249 pieces	47½
In lots of 250 to 499 pieces	52½
In lots of 500 and over	57½
Carriages, end for crane	17½
Car wheels, mine and industrial:	
Single flange web plate with plain hub:	
In lots of 1 to 49 pieces	37½
In lots of 50 to 99 pieces	42½
In lots of 100 to 249 pieces	47½
In lots of 250 to 499 pieces	52½
In lots of 500 and over	57½
Single flange, spoke center with plain hub:	
In lots of 1 to 49 pieces	32½
In lots of 50 to 99 pieces	37½
In lots of 100 to 249 pieces	42½
In lots of 250 to 499 pieces	47½
In lots of 500 and over	52½
Irregular designs: Self-oilers, special flanges, etc.:	
In lots of 1 to 49 pieces	27½
In lots of 50 to 99 pieces	32½
In lots of 100 to 249 pieces	37½
In lots of 250 to 499 pieces	42½
In lots of 500 and over	47½
Casings for centrifugal pumps	*
Cement mill miscellaneous	32½
Cement mill riding rings	30
Cement mill rollers	42½
Cement mill tires	30
Center fillers, bolsters:	
In lots of 1 to 49 pieces	35
In lots of 50 to 99 pieces	40
In lots of 100 to 249 pieces	45
In lots of 250 to 499 pieces	50
In lots of 500 and over	55
Center plates:	
In lots of 1 to 49 pieces	40
In lots of 50 to 99 pieces	45
In lots of 100 to 249 pieces	50
In lots of 250 to 499 pieces	55
In lots of 500 and over	60
Center stems	7½
Centrifugal pump castings	*
Charging bar supports	7½
Charging box heads and ends (cored):	
In lots of under 100 pieces	42½
In lots of 100 and over	47½
Charging box heads and ends (not cored):	
In lots of under 100 pieces	47½
In lots of 100 and over	52½
Charging boxes	47½
Circle plates, refractory	42½
Column bases:	
In lots of 1 to 49 pieces	52½
In lots of 50 and over	57½
Column guides for mine cars:	
In lots of 1 to 49 pieces	27½
In lots of 50 to 99 pieces	32½
In lots of 100 to 249 pieces	37½
In lots of 250 to 499 pieces	42½
In lots of 500 and over	47½

*Discounts on this class of work will be furnished on receipt of inquiry and drawings showing the castings desired.

Name of Casting:	Per Cent Discount
Columns, truck:	
In lots of 1 to 49 pieces	37½
In lots of 50 to 99 pieces	42½
In lots of 100 to 249 pieces	47½
In lots of 250 to 499 pieces	52½
In lots of 500 and over	57½
Copper ladles	27½
Copper mine miscellaneous	37½
Copper molds	42½
Counter balances	42½
Coupler carriers:	
In lots of 1 to 49 pieces	45
In lots of 50 to 99 pieces	50
In lots of 100 to 249 pieces	55
In lots of 250 to 499 pieces	60
In lots of 500 and over	65
Coupling boxes	50
Couplings, sugar mill	50
Covers for crane gears	7½
Covers, handhole	25
Covers, manhole	25
Cradles for mine cars:	
In lots of 1 to 49 pieces	27½
In lots of 50 to 99 pieces	32½
In lots of 100 to 249 pieces	37½
In lots of 250 to 499 pieces	42½
In lots of 500 and over	47½
Crane castings, miscellaneous	37½
Crane motor supports	7½
Crane truck castings	17½
Crank discs	42½
Crank webs	42½
Crossboxes	25
Crossovers	10
Crown wheels for sugar mills	50
Crusher frames, jaw	32½
Crusher housings, gyratory	32½
Crusher rolls, hollow	10
Cutter heads, dredge	*
Cylinders, accumulator:	
With walls over 1½ in. thick and simple flange on one end	17½
With walls 1½ in. thick or less and simple flange on one end	7½
All other designs	Net
Cylinders, hydraulic press:	
Plain surface with standard rectangular flange	32½
Irregular contour, with wings or special cored openings and flanges	22½
Die blocks	47½
Disks, crank	42½
Draft lugs (short):	
In lots of 1 to 49 pieces	45
In lots of 50 to 99 pieces	50
In lots of 100 to 249 pieces	55
In lots of 250 to 499 pieces	60
In lots of 500 and over	65
Drawheads, link and pin:	
In lots of 1 to 49 pieces	37½
In lots of 50 to 99 pieces	42½
In lots of 100 to 249 pieces	47½
In lots of 250 to 499 pieces	52½
In lots of 500 and over	57½
Driving wheel centers	45
Dredge cutter heads	*
Dredge miscellaneous	*
Dredge piping	25
End carriages, crane	17½
Engine castings, miscellaneous	35
Engine frames:	
Weighing less than 1000 lb	7½
Weighing 1000 to 2500 lb	20
Weighing over 2500 lb	35
Fittings, ammonia	10
Fittings, extra heavy flange	25
Fittings, hydraulic	25
Fittings, low pressure flange	10
Flange castings:	
In lots of 1 to 49 pieces	40
In lots of 50 to 99 pieces	45
In lots of 100 and over	50
Flange fittings, low pressure	10
Flange fittings, extra heavy	25
Flywheel hubs	42½
Flywheel segments	42½
Flywheels	42½
Frames, handhole	25
Frames, jaw crusher	32½
Frames, locomotive:	
Weighing less than 1000 lb	7½
Weighing 1000 to 2500 lb	20
Weighing over 2500 lb	35
Frames, manhole	25
Frames, ram	7½
Frames, riveter	45
Frames, stern for merchant ships:	
When cast in one piece	20
When cast in more than one piece	30
Frames, trolley for crane	7½
Freight car miscellaneous castings:	
In lots of 1 to 49 pieces	40
In lots of 50 to 99 pieces	45
In lots of 100 to 249 pieces	50
In lots of 250 to 499 pieces	55
In lots of 500 and over	60
Gear covers, crane	7½
Gear segments:	
In lots of 1 to 49 pieces	40
In lots of 50 to 99 pieces	45
In lots of 100 and over	50

Name of Casting:	Per Cent Discount
Gears:	
In lots of 1 to 49 pieces	40
In lots of 50 to 99 pieces	45
In lots of 100 and over	50
Gears, machine molded	*
Gears, railway motor	*
Grizzly bars	42½
Guards for sheave	7½
Guide brackets	7½
Gyratory crusher housings	32½
Gyratory crusher miscellaneous	37½
Hammer rams	47½
Handhole covers	25
Handhole frames	25
Headers	10
Heads, dredge cutter	*
Heads, hydraulic press	47½
Heads, peel	7½
Hearth jackets	47½
Hollow crusher rolls	10
Hollow racks, long	7½
Hollow shafts for crane	7½
Hollow stems for crane	7½
Hoods, bumper for crane	7½
Hopper castings	37½
Hoppers	37½
Hot metal or slag pots	37½
Housings, gyratory crusher	32½
Housings, pinion	50
Housings, roll	50
Housings, sugar mill	50
Hubs, flywheel	42½
Hubs, propeller	45
Hydraulic fittings	25
Hydraulic press cylinders:	
Plain surface with standard rectangular flange	32½
Irregular contour, with wings or special cored openings and flanges	22½
Hydraulic press heads	47½
Hydraulic press miscellaneous	37½
Hydraulic press nuts	55
Hydraulic press platens	47½
Impellers, centrifugal pump	*
Industrial car miscellaneous:	
In lots of 1 to 49 pieces	32½
In lots of 50 to 99 pieces	37½
In lots of 100 to 249 pieces	42½
In lots of 250 to 499 pieces	47½
In lots of 500 and over	52½
Jaw crusher frames	32½
Jaw crusher miscellaneous	37½
Joints, ball and socket	25
Journal box wedges (cored type):	
In lots of 1 to 49 pieces	47½
In lots of 50 to 99 pieces	52½
In lots of 100 to 249 pieces	57½
In lots of 250 to 499 pieces	62½
In lots of 500 and over	67½
Journal box wedges (solid type):	
In lots of 1 to 49 pieces	52½
In lots of 50 to 99 pieces	57½
In lots of 100 to 249 pieces	62½
In lots of 250 to 499 pieces	67½
In lots of 500 and over	72½
Journal boxes	*
Ladles, copper	27½
Ladles, slag	27½
Link and pin drawheads:	
In lots of 1 to 49 pieces	37½
In lots of 50 to 99 pieces	42½
In lots of 100 to 249 pieces	47½
In lots of 250 to 499 pieces	52½
In lots of 500 and over	57½
Lip rings for blast furnaces	37½
Locomotive frames:	
Weighing less than 1000 lb	7½
Weighing 1000 to 2500 lb	20
Weighing over 2500 lb	35
Locomotive miscellaneous	40
Lugs, short draft:	
In lots of 1 to 49 pieces	45
In lots of 50 to 99 pieces	50
In lots of 100 to 249 pieces	55
In lots of 250 to 499 pieces	60
In lots of 500 and over	65
Machine work	†
Machine molded gears	*
Manhole covers	25
Manhole frames	25
Manifolds	10
Mill pinions:	
Weighing less than 1,000 lb	17½
Weighing 1,000 to 2,500 lb	27½
Weighing 2,500 to 5,000 lb	32½
Weighing 5,000 to 50,000 lb	40
Weighing over 50,000 lb	42½
Mine car bumpers:	
In lots of 1 to 49 pieces	37½
In lots of 50 to 99 pieces	42½
In lots of 100 to 249 pieces	47½
In lots of 250 to 499 pieces	52½
In lots of 500 and over	57½
Mine car miscellaneous:	
In lots of 1 to 49 pieces	32½
In lots of 50 to 99 pieces	37½
In lots of 100 to 249 pieces	42½
In lots of 250 to 499 pieces	47½
In lots of 500 and over	52½

*Discounts on this class of work will be furnished on receipt of inquiry and drawings showing the castings desired.
†Net prices on machine work will be quoted on application.

Name of Casting:	Discount Per Cent
Mining machinery castings	40
Molds, copper	42½
Molds, slag	42½
Motor gears, railway	*
Motor supports, crane	7½
Nozzles	25
Nuts for hydraulic press	55
Pan rims, refractory	15
Passenger car castings	*
Pedestals for mine cars:	
In lots of 1 to 49 pieces	27½
In lots of 50 to 99 pieces	32½
In lots of 100 to 249 pieces	37½
In lots of 250 to 499 pieces	42½
In lots of 500 and over	47½
Peels and peel heads	7½
Pinions:	
In lots of 1 to 49 pieces	40
In lots of 50 to 99 pieces	45
In lots of 100 and over	50
Pinions, mill:	
Weighing less than 1,000 lb	17½
Weighing 1,000 to 2,500 lb	27½
Weighing 2,500 to 5,000 lb	32½
Weighing 5,000 to 50,000 lb	40
Weighing over 50,000 lb	42½
Pinion housings	50
Piping, dredge	25
Piping, steam—light	10
Piping, steam—extra heavy	25
Platens, hydraulic press	47½
Plates, anode	60
Pots, annealing	40
Propeller blades	20
Propeller hubs	45
Propeller wheels	10
Pulleys:	
In lots of 1 to 49 pieces	25
In lots of 50 to 99 pieces	30
In lots of 100 and over	35
Push pole pockets:	
In lots of 1 to 49 pieces	45
In lots of 50 to 99 pieces	50
In lots of 100 to 249 pieces	55
In lots of 250 to 499 pieces	60
In lots of 500 and over	65
Racks, gear:	
In lots of 1 to 49 pieces	40
In lots of 50 to 99 pieces	45
In lots of 100 and over	50
Racks, long hollow	7½
Railway motor gears	*
Ram frames	7½
Rams, hammer	47½
Rams, stripper	7½
Refractory miscellaneous	22½
Riding rings	30
Rings, riding	30
Riveter arms, boiler	10
Riveter frames	45
Riveter stakes	45
Riveter miscellaneous	32½
Road machinery castings	40
Rockers for mine cars:	
In lots of 1 to 49 pieces	27½
In lots of 50 to 99 pieces	32½
In lots of 100 to 249 pieces	37½
In lots of 250 to 499 pieces	42½
In lots of 500 and over	47½
Roll housings	50
Roller tires, refractory	27½
Rollers—cement mill	42½
Rolling mill miscellaneous	45
Rolls, hollow crusher	10
Rolls, rolling mill:	
Weighing less than 1,000 lb	27½
Weighing 1,000 to 2,500 lb	35
Weighing 2,500 to 5,000 lb	40
Weighing over 5,000 lb	47½
Roping and jacking castings:	
In lots of 1 to 49 pieces	42½
In lots of 50 to 99 pieces	47½
In lots of 100 to 249 pieces	52½
In lots of 250 to 499 pieces	57½
In lots of 500 and over	62½
Saddles, boiler	25
Scraper plates, refractory	32½
Segments, flywheel	42½
Segments, gear:	
In lots of 1 to 49 pieces	40
In lots of 50 to 99 pieces	45
In lots of 100 and over	50
Separators, steam	10
Shafts, hollow for crane	7½
Sheave guards	7½
Sheaves:	
In lots of 1 to 49 pieces	25
In lots of 50 to 99 pieces	30
In lots of 100 and over	35
Shoes, bridge:	
In lots of 1 to 49 pieces	52½
In lots of 50 and over	57½
Side bearings:	
In lots of 1 to 49 pieces	45
In lots of 50 to 99 pieces	50
In lots of 100 to 249 pieces	55
In lots of 250 to 499 pieces	60
In lots of 500 and over	65
Slag ladles	27½
Slag molds	42½
Slag pots	37½
Sleeves, stripper ram	7½
Smelting plant miscellaneous	37½
Snow plow castings	*
Spindles, solid	50
Sprockets:	
In lots of 1 to 49 pieces	25
In lots of 50 to 99 pieces	30
In lots of 100 and over	35
Stakes, riveter	45
Steam piping, light	10
Steam piping, extra heavy	25
Steam separators	10
Steam shovel castings	*
Steam traps	10
Stems, center	7½
Stems, hollow, for crane	7½
Stern frames for merchant ships:	
When cast in one piece	20
When cast in more than one piece	30
Striking castings:	
In lots of 1 to 49 pieces	40
In lots of 50 to 99 pieces	45
In lots of 100 to 249 pieces	50
In lots of 250 to 499 pieces	55
In lots of 500 and over	60
Stripper rams	7½
Sugar mill housings	50
Sugar mill miscellaneous	35
Supports, charging bar	7½
Supports, motor for crane	7½
Tires for cement mill kilns	30
Tires, roller—refractory	27½
Toggle plates, refractory	32½
Traps, steam	10
Trolley frames, crane	7½
Truck castings, crane	17½
Truck columns:	
In lots of 1 to 49 pieces	37½
In lots of 50 to 99 pieces	42½
In lots of 100 to 249 pieces	47½
In lots of 250 to 499 pieces	52½
In lots of 500 and over	57½
Tuyere jackets	37½
Tuyere stocks	35
Valve bodies	25
Valve castings	25
Webs, crank	42½
Wheels, brake for crane	7½
Wheel centers, driving	45
Wheels, crown for sugar mill	50
Wheels, fly	42½
Wheels, mine and industrial car:	
Single flange, web plate with plain hub:	
In lots of 1 to 49 pieces	37½
In lots of 50 to 99 pieces	42½
In lots of 100 to 249 pieces	47½
In lots of 250 to 499 pieces	52½
In lots of 500 and over	57½
Single flange, spoke center with plain hub:	
In lots of 1 to 49 pieces	32½
In lots of 50 to 99 pieces	37½
In lots of 100 to 249 pieces	42½
In lots of 250 to 499 pieces	47½
In lots of 500 and over	52½
Irregular designs, self-oilers, special flanges, etc.:	
In lots of 1 to 49 pieces	27½
In lots of 50 to 99 pieces	32½
In lots of 100 to 249 pieces	37½
In lots of 250 to 499 pieces	42½
In lots of 500 and over	47½
Wheels, propeller	10
Wheels, worm:	
In lots of 1 to 49 pieces	25
In lots of 50 to 99 pieces	30
In lots of 100 and over	35
Worms and worm wheels:	
In lots of 1 to 49 pieces	25
In lots of 50 to 99 pieces	30
In lots of 100 and over	35

*Discounts on this class of work will be furnished on receipt of inquiry and drawings showing the castings desired.

Increase in Automobile Production

Figures received by the Department of Commerce show a large increase in May in the production of passenger automobiles and trucks. The total production of passenger cars in May, so far reported by 91 companies, amounted to 231,699, compared with 197,221 in April, an increase of nearly 18 per cent. The total truck production of 82 companies in May was 24,603 machines, compared with 22,227 in April.

With a few exceptions, the following table represents the production of identical firms for each month:

Automobile and Truck Production

1922	Passenger Cars	Trucks
January	81,693	9,344
February	109,170	13,121
March	152,959	19,651
April	197,221	22,227
May	231,699	24,603

RAPID PRODUCTION LATHE

New Heavy-Duty Tool for Small Work—Attachment for Simultaneous Turning and Facing

An 11-in. heavy-duty rapid production lathe supplementing its larger line of manufacturing lathes, and intended to provide a tool for heavier cuts, larger production and quicker manipulation than hitherto considered possible on a lathe of the rated size, has been brought out by the R. K. Le Blond Machine Tool Co., Cincinnati. The new machine, shown in the accompanying illustrations, embodies the essential features of the company's line of heavy-duty lathes.

The headstock is of the selective-speed type and provides six speed changes, ranging from 50 to 250 r.p.m. through sliding gears, from a constant speed driving pulley. The main driving pulley is 12 in. in diameter, takes a 3-in. belt and is equipped with a multiple disk, automobile type, driving clutch which runs in oil. A substantial bushing provided for the drive pulley is intended to relieve the drive shaft of the belt pull. All gears are of nickel steel, heat treated and hardened, have stub form teeth and are rounded to permit easy engagement. The sliding gears are on short high carbon shafts which have four keyways, the keys in the gears being broached from the solid.

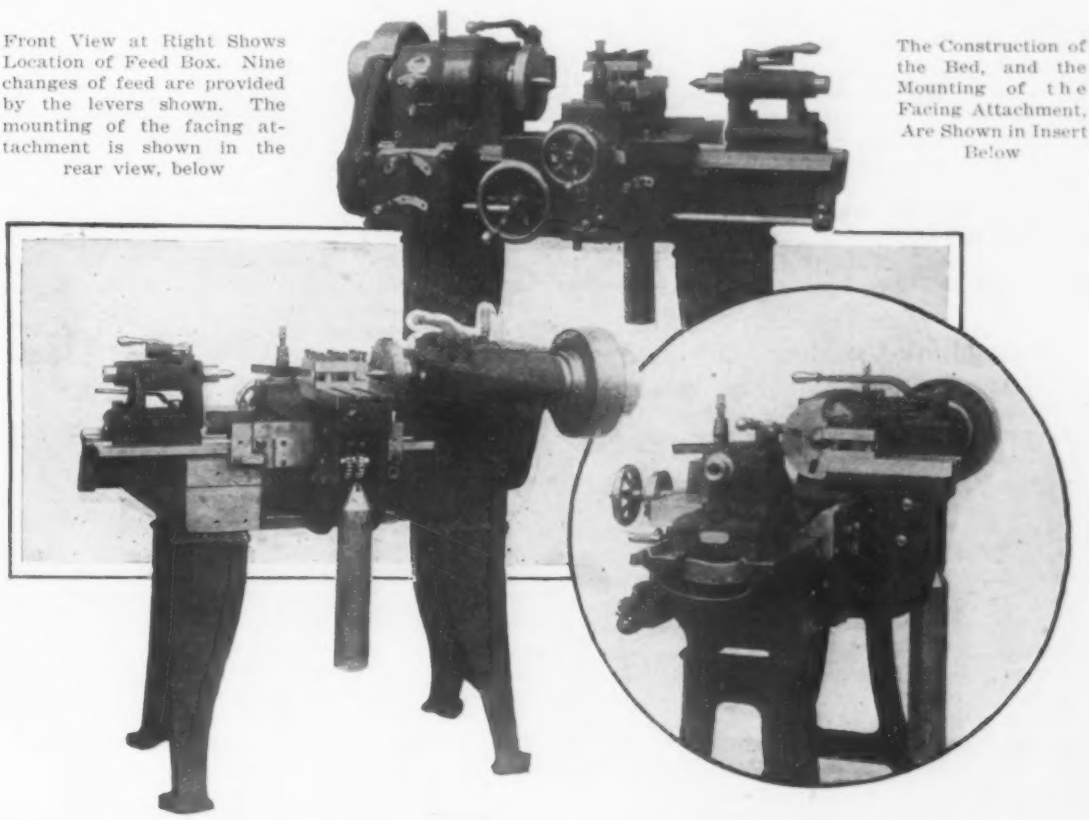
The spindle is unusually large and runs in taper bronze bearings, babbitt lined and adjustable for wear, and provided also with ball-thrust bearings. The entire headstock mechanism is inclosed and all gears and bearings are flooded continuously with oil. The spindle is provided with a large hole for passing work through it, or for mounting draw-in or expansion chucks, either hand or pneumatic operated. The front spindle bearing is 4¼ in. long, 3⅜ in. in diameter at the large end and has a taper of 1½ in. per foot. The rear spindle bearing is 3¼ in. long and 2⅛ in. in diameter. The diameter of the nose of the spindle is 2⅝ in., the size of hole 1 11/32 in. and size of center, No. 3 Morse. Two levers control the six speeds. The starting lever applies a friction brake on the spindle on releasing the driving clutch.

The heavy-duty bed is a feature emphasized. This is of unusual depth and is strongly braced by box section girths. It is claimed that this bed section provides a carriage bearing surface greatly in excess of other lathes, and forms a thrust bearing at right angles to the tool pressure on all diameters within the swing. The length of the bed is 4 ft. and between centers, 18½ in.

The carriage is unusually long and is scraped to a bearing its entire length on the bed. The bridge is wide and deep to give rigidity without making the carriage cumbersome. The carriage bearing surfaces are broad and placed to absorb the pressure resulting from heavy turning. Gear and shaft bearings in the apron are cast integral with the apron itself. Both feeds are operated by a single positive clutch and only one feed can be in operation at one time. The company's standard plain block rest and the No. 1 single screw tool post with collar and elevating wedge are included in the new machine. The travel of the rest is 3 in. and size of tools ½ by ⅞ in. A turret tool post can also be provided.

Front View at Right Shows Location of Feed Box. Nine changes of feed are provided by the levers shown. The mounting of the facing attachment is shown in the rear view, below

The Construction of the Bed, and the Mounting of the Facing Attachment, Are Shown in Insert Below



The automobile feed incorporated is designed to meet the requirements of large-quantity plain turning and facing work. The mechanism consists of a box casting adjusted to the front of the bed and provides nine changes of feed by the two levers shown. The lower lever compounds the range obtainable with the top lever, giving quick change of feed for roughing and finishing cuts without the necessity of gradually stepping the feed up through all the gear combinations. The box is driven directly from the spindle by a roller sprocket chain, shown inclosed. The gears are of alloy steel, heat-treated and hardened. There are nine feeds, ranging from 0.008 to 0.092 per revolution of the spindle.

An improved lever-operated, quick acting tailstock is provided, which permits quick removal and replacing of work with a single movement of the handle. The center is brought into contact with work at any pressure by a lever, the further movement of which rigidly locks the tailstock barrel and clamps the spindle. The tailstock spindle is 1 13/16 in. in diameter and the travel 2½ in.

Attachment for Facing Operations

A facing attachment as shown in the illustrations can be provided for facing or grooving operations.

It converts the machine into a semi-automatic lathe, performing turning and facing operations simultaneously and covering a field of smaller and lighter work than the company's "Multi-Cut" lathes. The attachment is mounted on a bracket bolted to a planed pad on the rear of the bed and is adjustable to any position along the bed, a cast iron form plate being bolted to the carriage and traveling with it. The form plate can be readily replaced with one of greater or less taper to vary the ratio of feed between the carriage and the facing slide.

A roller on the facing attachment engages the form plate and transmits the motion through rack and pinion to the facing slide, which is fed toward the center of the lathe on a broad dove-tailed slide. As the carriage is brought back along the bed to the starting position, the facing attachment is also brought back automatically by the weight illustrated. The travel of the facing attachment slide is 2½ in., and the size of tools ½ by ⅞ in.

The multiple tool block shown is extra, as many companies prefer to supply their own tool blocks, made up for a specific job. Other equipment that may be provided extra, include a draw-in attachment and collets; jack shaft; two-speed friction countershaft; special tool blocks and drivers for special jobs; oil pump, pan and piping; automatic stop for carriage, and multiple cross stops.

The capacity is turn 13¾ in. diameter, 18½ in. in length and face, with facing attachment, 2½ in. on side. The net weight of the machine with facing attachment is 1050 lb.

Radius Link Grinding Machine

A new radius link grinding machine designated as the No. 762, and particularly adapted for the grinding of reverse links and blocks for locomotive and similar work, has been placed on the market by the Newton Machine Tool Works, Inc., Philadelphia.

The range of the machine is for a radius of from 18 to 100 in., with a maximum table stroke of 30 in. and a minimum of 2 in. The wheel spindle has a horizontal adjustment of 6 in., for work of different widths. The table is 18 by 42 in., which provides ample clampage for various parts. It has hand adjustment and is reciprocated automatically by dogs. Three speeds are provided, 5 ft. 3 in., 7 ft. 10 in., and 10 ft. 6 in. per min. The reciprocating motion incorporates a dwell to permit operation of the vertical feed to the wheel and remove pressure during the reversal. The slide carrying the table is fitted at either end with cast-iron shields, so that the bearing is never uncovered.

The base is a box-type casting to the front of which the radius arm support is bolted and doweled and to the back of which the column is likewise fastened.

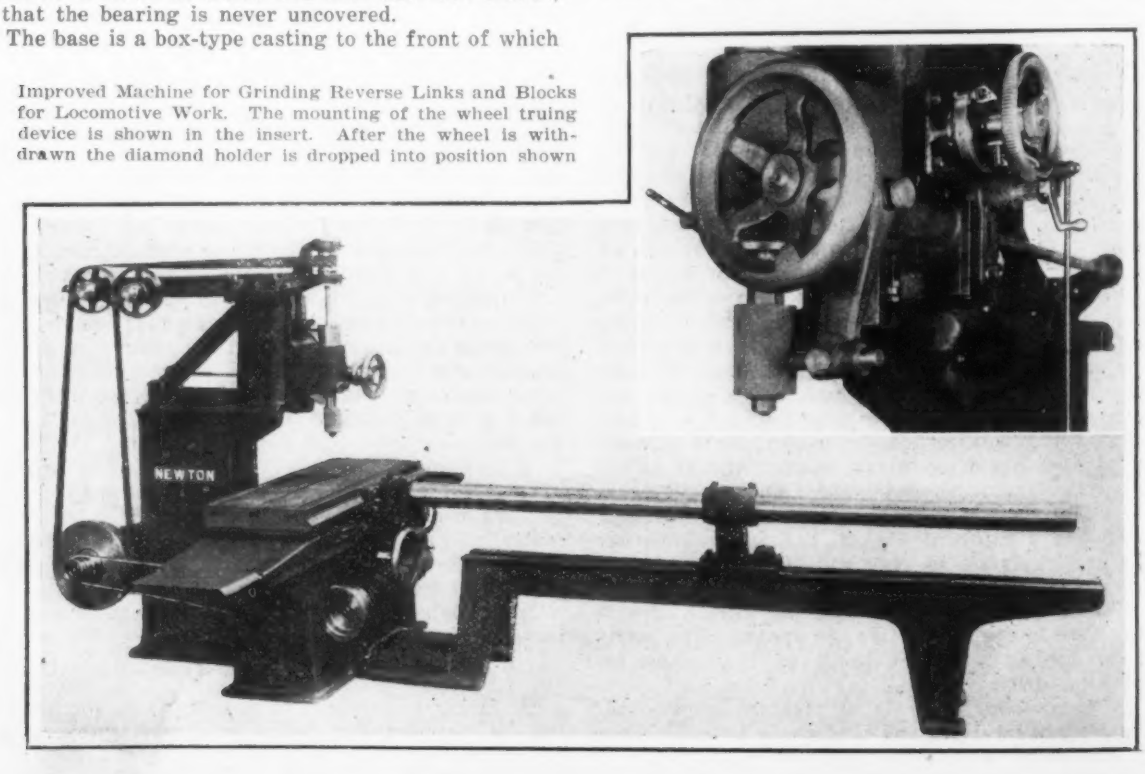
The spindle has a taper end for arbor fit and is provided with ball bearings, with the driving pulley carried on separate ball bearings, so that there is no thrust other than that of rotation. The spindle sleeve has 3 in. adjustment in the slide. The diameter of the spindle in the bearings is 1⅜ in., and through the drive pulley, 1 in. The speed of the spindle is 6000 r.p.m. The distance from the spindle to the center of the column is 13 in., maximum; and 7 in., minimum. The spindle slide is counterweighted and provided with hand adjustment, oscillating motion for using wide-face wheels, and an intermittent feeding motion for narrow-face wheels, this motion being reversible by a ratchet box. The vertical motion of the spindle slide is 8⅝ in. The spindle head is adjustable on the upright for setting the depth of cut and has sufficient movement to permit of grinding blocks as well as links. This motion is brought to a convenient position for the operator.

The wheel truing device is mounted as shown in the separate illustration. The motion of the spindle slide is available for truing the wheel and can be readily swung out of position when not in use. After the wheel is withdrawn the diamond holder is dropped into position shown. The bracket, carrying the pinion and crank handle, is moved up to engage teeth cut on the hand wheel. With the reduction thus obtained a uniform motion of the spindle slide is maintained by turning the crank handle.

The machine is driven by a 5-hp. 1200 r.p.m. motor or by a single pulley through a 2 in., endless belt. Self-alining ball bearings are used in the drive, feed bearings, where essential, being bushed. The radius bar is a 4 in. diameter tube, the pivot bearing being adjustable on the support by rack and pinion. The length of radius is controlled by scale.

The floor space occupied by the machine is 14 ft. 3 in., by 9 ft. 6 in., and the height overall, 6 ft. 7½ in.

In Scientific paper of the Bureau of Standards, No. 433, entitled, "Thermal Expansion of a Few Steels," the critical regions of steel are used as a basis for heat treatment in securing or retaining desirable qualities such as hardness, elastic properties, tensile strength, etc. Data are presented in tabular form and in curves showing the dimensional changes of steel in passing through these regions. Electrolytic iron and cast iron are also included. One specimen of hardened steel is analyzed, by dimensional changes, to show the release of strains on heating.



Improved Machine for Grinding Reverse Links and Blocks for Locomotive Work. The mounting of the wheel truing device is shown in the insert. After the wheel is withdrawn the diamond holder is dropped into position shown

Malleable Castings Research Laboratory

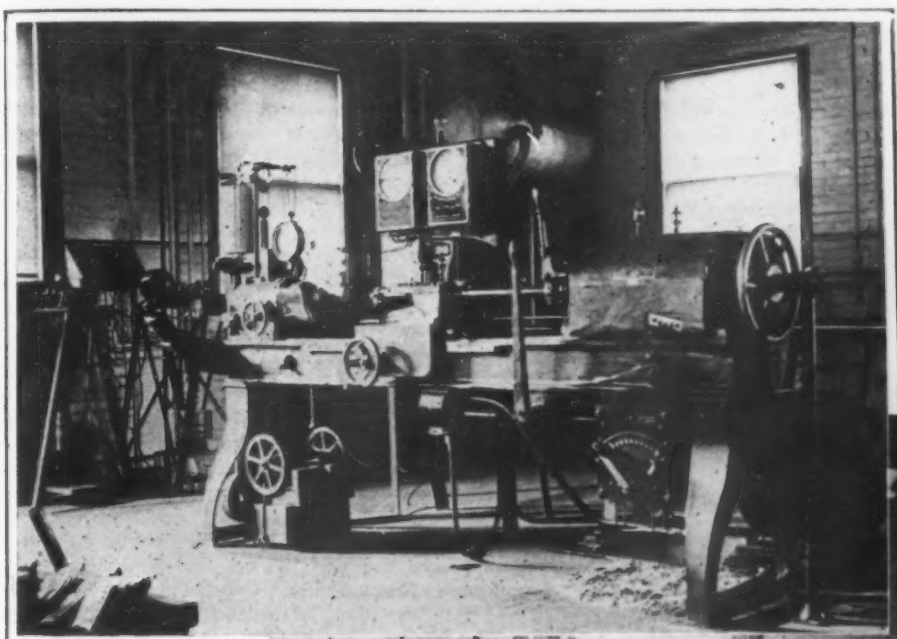
Freedom from Routine Tests Permits Concentration on Work to Advance the State of the Art

RESEARCH work in connection with the malleable iron industry was undertaken by the National Malleable Castings Co., at the laboratory of the Indianapolis plant in 1903. After completing its new foundry at Cleveland, this company established, in connection with the general offices in Cleveland, a fully equipped laboratory for research work which, as nearly as possible, is a pure science laboratory. It concerns itself very little with routine tests, as each of the company's foundries has its own plant laboratory for this purpose. Whatever analytical work is done is only incidental to the various investigations.

Of interest in connection with the laboratory is the fact that virtually all the equipment, including the optical, chemical and porcelain apparatus, is of American manufacture. Heretofore this equipment has been supplied largely by Germany. Only one important piece of equipment comes from abroad, that being of English make.

This laboratory has two major purposes. One is the study of metallurgy of malleable cast iron and cast steel and the other is the study of the physical properties of these metals as manufactured into castings. The metallurgical work is largely a study of graphitization and of the equilibra in the stable and the metastable conditions of iron carbon alloys and ternary alloys containing iron and carbon. The metallurgical investigations are conducted to determine the principles and methods for the attainment of the desired ends as to the properties and quality, while the physical testing laboratory determines the properties of the various products as related to the method of manufacture and to the customer's requirements.

Materials testing, physical, chemical and metallographic departments, each has its own laboratory, all in a three-story, brick and concrete, fireproof structure, 50 x 70 ft., of a high-grade type of construction. The chemical, physical and metallurgical laboratories are on the third floor, where the chemical department occupies five rooms—two laboratories, a balance room, chief chemist's office and sample preparatory room. One chemical laboratory has a double hood, permitting use from both sides. The hood is of concrete laid on wire lath and painted with Toch acid-proof enamel. The hood table and the two bench tops in the general chemical room are of soapstone, this being used where heat is employed. Other bench tops are of birch coated with an acid-proof finish. The tables in the balance room



Testing Machine with Attachments for Recording Pressures and Power Impact. This is an efficiency machine, designed to determine the loads set up in cutting metals

The Hood Is of Concrete Laid on Metal Lath and Painted with an Acid-proof Enamel. The table and bench tops are of soapstone, wherever heat is employed. Lighting is ample

and in the physics room are of concrete, being integral with the building to avoid danger of vibration.

Experimental work in heat treating and melting is carried on in the metallurgical laboratory. This is provided with an Arsem vacuum and two carbon resistor furnaces for high temperature work and several Hoskins and Leeds & Northrup electric furnaces for heat treating. The latter are provided with automatic control equipment with which the temperature is held within a range of 5 deg. Cent. (9 deg. Fahr.). As the material is kept in the furnaces from 400 to 500 hr., in many heat-treating operations automatic furnace controls are necessary.

The physical laboratory is unusually well equipped for high temperature measurements. Work in this laboratory includes also electrical and magnetic measurements, critical point work on steels and some investigation of the thermal properties of iron and steel.

Second Floor Layout

On the second floor are the offices and library, occupying half of the floor space, and the metallographic laboratory. The latter is equipped with a Bausch & Lomb inverted type of microscope for visual and photographic work and with a chemical microscope, for use on the same bench, for the examination of transparent specimens.

Polishing wheels of special design are provided for preparing specimens. These have a 6-in. plate glass disk, each disk being supported by one thrust and two angular ball bearings. These are provided to maintain a constant plane of rotation of the polishing disk. The speed of the polishing wheels is 400 r.p.m., or slower than that of most polishing wheels. There is a dark room, in connection with the metallographic department, located in the middle of the building, surrounded by walls and ventilated by a stack through the roof. Entrance is through a light trap or zig-zag passageway. The dark room has a Kelvinator electric refrigerator so that development work can be done in hot weather without danger of the plates melting. These are either developed in the refrigerator or the solutions are kept in it.

It is the intention eventually to have a museum and gas and fuel laboratories. Rooms on the second floor that will be used for these purposes are now utilized for store rooms.

Material Testing on First Floor

Occupying half of the ground floor space, the materials testing department is located in one large room, well equipped with various physical testing equipment, practically all built by the Olsen Testing Machine Co. There is an especially designed 50,000-lb. universal, vertical, four-speed testing machine capable of taking specimens 6 ft. long for tensile tests and 8 ft. long for compression tests. This machine is equipped with an extra poise for reducing the capacity to 25,000 lb. and doubling its sensitivity. There is also a standard type of four-speed horizontal testing machine with a capacity of 200,000 lb. and a 60,000-inch-pound torsion machine that can handle pieces up to 5 ft. long.

Already the laboratory has done a great deal of research work along the line of machineability of ferrous products, including malleable iron, castings, cast steel and wrought iron. The result of its investigations in this direction has been embodied in a report which is now in the hands of the Society of Automotive Engineers. In connection with this work an Olsen efficiency machine is used to determine the loads that are set up in cutting metals. Investigation work was conducted relating to stresses on drills when working in malleable iron, to determine what effect variation in the quality of the castings and the shape, speed and feed of the drill will have on the work required to remove a given bulk of metal.

Next in this general line of investigation is to determine the life of cutting tools while cutting at different rates of speed. The laboratory is now building special equipment for this purpose. Further investigations along this line to be taken up include milling, tapping, reaming, turning and other machine operations on malleable castings. Another study to be made on the efficiency machine will cover the frictional wear resistance of materials. The efficiency machine is fitted with a pressure recorder, recording watt meter and integrating watt meter.

Fatigue of metals and the manner in which metal resists impact are being given a great deal of study. An investigation, recently completed, of the resistance of normal malleable iron to fatigue, developed the fatigue limit at 26,000 lb. per sq. in., or approximately the same as wrought iron and ingot iron. At loads above the fatigue limit the resistance of malleable iron to fatigue was found to be greater than that of competitive materials, such as wrought iron or annealed carbon steels, although not so great as that of special alloys or special heat treated steels. Fatigue tests are now in progress on cast steel made by the company for Maco anchor chain.

Fatigue tests are conducted on two Farmer fatigue machines that are identical in type with the machines used in the fatigue of metals investigation now being conducted by the National Research Council under the direction of Prof. H. F. Moore, differing only in construction details.

Other equipment of the materials testing laboratory are a Brinell hardness machine, Shore scleroscope, and a Charpy pendulum hammer for impact testing. This is an American machine built by Sauveur & Boylston, consulting metallographical engineers, and is a duplicate of the French machine at the Watertown arsenal. In connection with the materials testing laboratory, there is a tool room in which various special apparatus is built. The thoroughness with which some of the research work is carried on is indicated by the fact that, in one heat treating investigation in connection with anchor chain, one ton of test pieces was used, each weighing 1 lb. before machining.

Services to the Laboratory

Alternating current at 110 volts and 220-volt direct current are supplied for electric melting and heating furnaces, machine operations, lighting, etc. All heating of furnaces, hot plates, etc., is done electrically except where experiments require gas, which is supplied in all rooms. The physical and one chemical laboratory have 6 and 12-volt storage battery current. All rooms have hot water heat, hot and cold water and compressed air at 80 lb. pressure for pressure work and 4 lb. for blast. One chemical laboratory has oxygen piped to the benches and both have vacuum at each bench. A still is provided for distilling water, which is conveyed to an analytical laboratory through glass tubes. Hydrogen, carbon dioxide, nitrogen and argon are supplied in pressure tanks.

Features were incorporated in the design and arrangement of the building to protect the laboratory staff in case of an explosion or fire. The stair well, located in the center of the building at the front is a fireproof inclosure, steel doors connecting this with the various rooms, so that fire cannot reach the stairs. The offices and library on the second floor are separated from the laboratory on that floor by a terra cotta fireproof wall. A steel stair type fire escape is provided for exit from the third floor, so that there are two ways to escape in case of an explosion. The furnace room has a shower for use in case clothing ignites.

The work of inspecting and testing, to give assurance that products are up to the required standard, is handled by a separate general inspecting and testing department acting in harmony with the research department. Each plant has its own laboratory under the supervision of local management and in this all routine tests are made, the plant laboratories being guided in their technical activities by the research laboratory. Physical tests made locally are available to the resident inspector, who represents the general inspecting and testing department at the plant. Each plant uses the standard test pieces called for in the specifications of the American Society for Testing Materials, at least one bar from each heat being tested. The research laboratory is in charge of Harry A. Schwartz, manager of research, and the laboratory staff consists of eight men.

The Iron and Steel Industry in Australia

Iron Ore Resources—Early Plants—Newcastle Works of the Broken Hill Proprietary Company

BY DAVID BAKER*

FROM government records we learn that the European navigators who first reached the shores of Australia found the inhabitants without iron; neither have there since been discovered heaps of cinder, nor other relics of ancient iron industries.

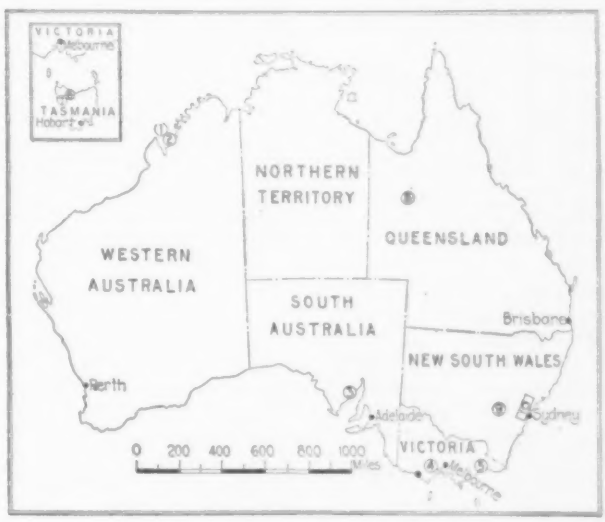
Iron Ore Deposits

As the discovery of iron ore deposits in the commonwealth is associated with the early attempts at iron making, this latter development will be considered in connection with the description of the ore deposits of each state.

Western Australia: The most important deposits in this state are the deposits of Koolan and Cockatoo Islands in Yampi Sound. The main deposit stands out abruptly above high water level to a height, in places, of 600 ft. There are estimated to be 68,850,000 tons of iron ore averaging about 65 per cent iron. On the northern end of Koolan Island there is another deposit, estimated to contain 7,800,000 tons averaging 66 per cent iron.

The Cockatoo Island deposits, Yampi Sound, have an estimated tonnage available above high water level of 13,850,000 tons, averaging about 68 per cent iron. Some of the richest and most extensive deposits are valueless owing to their geographical position.

Victoria: Professor Krause estimates the Lal Lal deposit to have 750,000 tons of available ore, containing 68 to 70 per cent oxide or iron. About 1875 a small experimental blast furnace was erected at Lal Lal, near Ballarat, and a small quantity of pig iron produced.



Iron Ore Deposits

		Tons
1	W. Australia—Koolan Island, Yampi Sound.	Approx. 75,000,000
2	W. Australia—Cockatoo Island, Yampi Sound.	Approx. 20,000,000
3	S. Australia—Iron Monarch, Iron Knob, Iron Baron.	Approx. 40,000,000
4	Victoria—Lal Lal	Small quantity
5	Victoria—Nowa Nowa	Small quantity
6	Tasmania—Blyth River	Approx. 17,000,000
7	Tasmania—Long Plain	Approx. 20,000,000
8	Queensland—Mt. Leviathan. Quantity unknown.	Say 10,000,000
9	N. S. Wales—Cadia	40,000,000

Coal Deposits

10	N. S. Wales—From Maitland Field to Bulli.	Estimating 2,000,000,000

Victoria—Beds of lignite. Quantity unknown.
Queensland—Unestimated.

Tasmania: The following is a summary of the iron ore deposits of Tasmania, supplied by the geographical survey:

Districts	Potential Tons
Blyth River lode	17,000,000
Dial Range and Penguin	700,000
Beaconsfield and Anderson's Creek	1,300,000
Long Plain	20,000,000
Zeehan District	2,900,000
Nelson River	Unknown
Total	41,900,000

The Blyth River deposits are the most important, with the iron contents varying from 46 to 68.7 per cent.

The British and Tasmanian Charcoal Iron Co. was formed between 1872 and 1875 to exploit the iron ore deposits in the Beaconsfield district; £80,000 was expended in erecting works, and several hundred tons of pig iron were produced, but on account of its containing 5 per cent chromium and not being adaptable to ordinary uses, the operations were not a financial success.

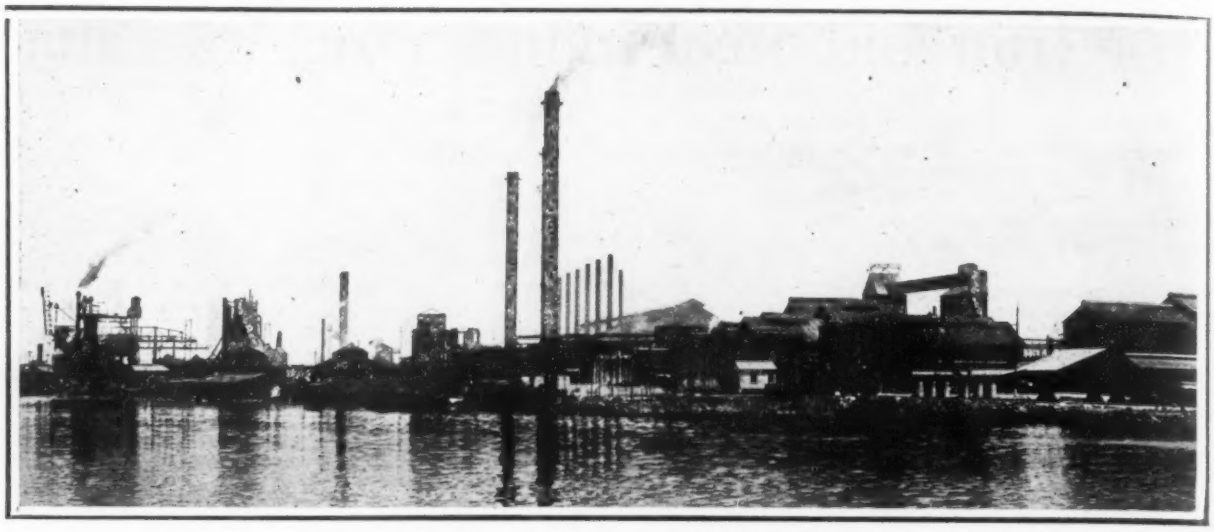
South Australia: The ironstone deposits of this state are very numerous, but the only ones that have been extensively worked are the Iron Knob and Iron Monarch deposits, which are owned by the Broken Hill Proprietary Co., Ltd.

In the Iron Monarch and Iron Knob there is a large deposit of iron ore, estimated at least 21,000,000 tons. A later geological report puts this at 130,000,000 tons.

Queensland: Dr. Logan Jack refers to the enormous deposits of specular iron, hematite and magnetic in the Cloncurry districts. One of these deposits, Mount Leviathan, is about 200 ft. high and 1300 ft. in diameter at its base. Its geographical position "causes it at present to be absolutely valueless."

*General manager the Broken Hill Proprietary Co., Newcastle, New South Wales, Australia.

Broken Hill Proprietary Co.'s Plant (Looking Southeast), Newcastle, New South Wales, as It Appeared in January, 1922



Coke Ovens and By-Product Plant of the Newcastle Works

During the war a royal commission was appointed by the Queensland Government to inquire into the advisability of establishing state iron and steel works. Owing to the prevailing business depression all work on the proposed iron and steel works for the state has been stopped, and while the general manager is still retained, and the site for the works chosen, it is reported that all other employees of the department have been dismissd.

New South Wales: The iron ore deposits of New South Wales are both numerous and scattered in their occurrence; the following is a summary:

District	Description of Ore	Estimated minimum quantity ore in tons
Bredalbane	Brown ore and hematite	700,000
Cadia	Specular hematite, magnetite and carbonate ore	39,000,000
Carcoar	Hematite and brown ore	3,000,000
Chalybeate Spring—Deposits of Southern District	Brown ore	1,510,000
Cowra (Broula)	Magnetic ore	100,000
Goulburn	Brown ore	1,022,000
Gulgong	Magnetic ore	120,000
Mandurama and Woodstock	Brown ore	609,000
Marulan	Brown ore and hematite	40,000
Mudgee	Brown ore with manganese	150,000
Newbridge, Blayney and Orange	Brown ore and magnetic ore	150,000
Quenbeyan (Paddy's Point)	Magnetic ore	1,000,000
Rylstone and Cudgegong	Brown ore	443,000
Wallerawang and Piper's Flat	Brown ore	200,000
Williams and Karuah River	Titaniferous magnetic ore	1,973,000
Wingello	Aluminous ore	3,000,000
		53,017,000

The first attempt to manufacture pig iron in New South Wales was made at the Fitzroy Iron Works, near Mittagong, on the Southern Railway. No complete account of the quantity of pig iron which was manufactured is available.

[Descriptions of the Lithgow Iron Works and the Hoskins Iron & Steel Co., Ltd., are given here, followed by complete details of the Broken Hill Proprietary Co., Ltd.]

Broken Hill Co.'s Newcastle Plant

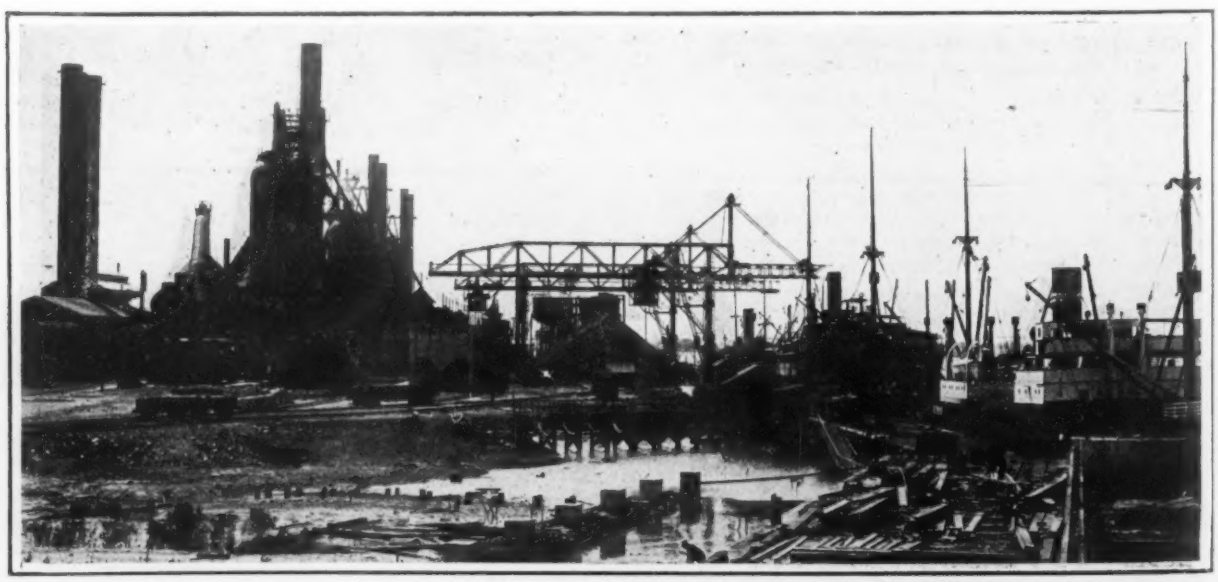
The Newcastle works of the Broken Hill Proprietary Co., Ltd., as originally planned were to consist of one 350-ton blast furnace, three 65-ton basic open-hearth furnaces, one 35-in. blooming mill, and one 28-in. rail and structural mill, with the necessary by-product ovens to supply coke for the blast furnace. The plans of the works were completed early in 1913, and the material ordered that year. The blast furnace was lighted March 9, 1915, and the first steel was made April 9, the first ingot bloomed the same day, while rail rolling started April 24. The formal opening of the works under the direction of the Governor General, Sir Ronald Munro Ferguson, took place June 2, 1915.

Since the original installation was laid down at Newcastle the works have been increased and now consist of the following plant:

Coke Oven Department, with 224 Semet-Solvay by-product ovens of the recuperative type, arranged for recovery of tar, sulphate and benzol.

Blast Furnace Department, with 2 furnaces 85x20 ft., 1 furnace 90x20 ft., and 1 furnace 68x12 ft., this latter being for the manufacture of ferromanganese.

The ore yard is spanned by two Hoover & Mason bridge



Blast Furnace Department of the Newcastle Works with Receiving and Shipping Wharves. Picture was taken last January

unloaders, equipped with 6-ton grab buckets, which deliver the ore and limestone from the skips to the stock pile, or into a 50-ton transfer car for distribution to each of the four blast furnaces. The molten basic pig iron is taken direct to the open-hearth, and the excess of metal poured into a pig machine which discharges into the open-hearth stock-yard. Foundry pig iron is poured over another pig machine equipped with a travelling gantry for handling the cold pig and stacking same according to analysis.

The Open-Hearth Department consists of 7 basic furnaces of 65 tons rated capacity, but with hearths 33 ft. 6 in x 15 ft., and two 100-ton pit cranes, one 75 and one 60-ton hot metal crane, and a 1000-ton mixer.

The Blooming Mill is provided with three 4-hole pit furnaces, a stripping crane, and 2 pit cranes. The mill is a 35-in. geared Mackintosh & Hemphill design, with two high-pressure cylinders 66 x 42-in., the steam pressure being 150 lb. at the engine. There are also two mechanical shears, one for cutting blooms and blanks going to the rail mill, the other for taking the billets from transfer beds and cutting this product for the market or for re-rolling in the 18-in. merchant mill.

The Rail Mill consists of three strands of rolls in line, of 28-in. pitch diameter, and equipped with two travelling tables and a stationary saw run. The rolls are driven by a double high-pressure reversing engine with cylinders 66 x 42 in., the steam pressure at the engine being 150 lb. The engine is controlled from a pulpit in plain sight of the rolling operation, and while the engine is slowed down when the piece is introduced into the rolls, it is speeded up to 150 revolutions when the piece is in the finishing pass. The mill is equipped with two 60-ton travelling cranes, and a double set of housings, so that each strand of housings and rolls are lifted at one time and replaced with the other set with rolls and guides set. All blooms and blanks when received from the blooming mill are re-heated in two regenerative heating furnaces fired with coke oven gas. The product of the mill consists of tee rails from 45 to 100 lb., girder rails, angles, heavy rounds, channels and joists up to 15 in., the largest size required to date.

This mill has never been supplied with sufficient steel to test its full capacity, as the blooming mill is required to do jobbing work and to supply the 18 in. merchant train with billets.

The finishing department of the mill is provided with 3 hot beds, 4 rail presses, and ending machines, and each rail is ended to exact length after straightening, the standard length of 80, 90, and 100-lb. rails being 40 ft. The rail stock-yard is 75 ft. wide and 1,000 ft. long, and is provided with two 25-ton cranes equipped with magnets for stocking and loading purposes. Along one side of the mill is a 50-ft. lean-to, containing the roll shop, equipped with a 20-ton crane, and an extension to the crane runway forms the roll yard.

Merchant Mills.—This department consists of one 18-in. mill equipped with 4 travelling tables and 2 continuous billet heating furnaces, also finishing equipment and hot beds to take care of light rails, heavy merchant bar, fishplates, and billets; one 12-in. mill and one 8-in. mill are installed in a separate building, each equipped with continuous heating furnaces and hand hotbeds. There is also adjoining the merchant mills a double-strand Morgan continuous rod mill, arranged to be fed from the billet yard receiving the product from the 18-in. mill.

Shops.—Mechanical repairs and considerable construction work are economically handled by a large and well-equipped machine shop, and a steel foundry equipped with a 20-ton acid open-hearth furnace; a direct metal foundry for the manufacture of ingot molds and heavy castings with hot metal from the blast furnaces; and suitable shops for the other mechanical trades.

Power House.—The power for the works is obtained from a D. C. station located close to the blooming and rail mill, and supplied with steam from an extension of the rail mill boilers.

Production.—The problem of the production of a satisfactory grade of basic steel for all requirements has been worked out to meet local conditions in Australia, and some of the methods and results obtained form a part of the history of the development of the iron and steel industry in this country.

Starting from the production of the coke, as the fuel produced was of a friable nature it became necessary to exercise unusual care in the delivery of coke to the blast furnaces, and accordingly inclined coke benches with screen bars were installed at the coke ovens, the coke from these benches being delivered in narrow gage trucks to the blast furnace stock-yard, each truck containing a skip load and handled so that it discharges its contents direct into the skip. This reduces the loss in coke breeze to 5 per cent.

In the production of pig iron, arrangements were made at the quarries and at the mine so that a finely crushed ore is delivered to the stock-yard at the furnaces, and a suitable crushed limestone as flux. As the ore and coke contain a high percentage of alumina, a certain quantity of silica rock and open-hearth slag is used to increase the slag volume to what is required for easy smelting conditions. The large furnaces are equipped with concrete ore bins, single skips and the Baker and Neumann rotary distributors. The production of the furnaces has exceeded the original estimates, so that there has been no difficulty in obtaining from the three larger furnaces a regular output of 3,000 tons of basic pig iron per week from each stack, without forcing. This has been accomplished with a 13-ft. hearth, and gives prospect that with the adoption of larger dimensions a very much larger production per furnace will result.

In the production of steel in the basic furnaces, the scrap supply in Australia being a negligible quantity, the problem encountered was that of operating the furnaces on a mixture of 80 per cent pig iron and only the scrap made in the works. This situation has been very satisfactorily met by a modification of design of the open-hearth furnaces, so that whereas at the start the average time for producing a heat of steel was approximately 12 hr., it has been reduced to less than 7½ hr. (half-yearly average), with an occasional heat produced in 3 hr., 50 min. It has therefore been possible to produce steel at the rate of 36,000 tons per month, with an occasional week of 11,000 tons.

The rail mill as now equipped has a capacity of 1,650 tons per day, of 80 lb. rails, but by driving the intermediate and finishing strands by a separate engine or motor, and adding additional tables, the capacity of the mill may be doubled.

Plans have been prepared and a large part of the equipment purchased for the following extensions to the works: Additional open-hearth furnaces to permit the conversion of 550,000 tons of basic pig iron into steel; a 40-in. electrically driven blooming mill supplying a 24-in. and 18-in. Morgan continuous billet and sheet bar mill; a Morgan 10-in. continuous merchant mill. In order to supply electric power for these extensions of the plant, a power house is to be built where the surplus gas from the blast furnaces can be utilized to supply the power required.

[Some subsidiary industries are then described, including the Austral Nail Co., Lysaghts Newcastle Works, Ltd., etc.]

One of the great lessons of the war is the importance of making the country self-contained as far as supplies for the maintenance of the high standard of living established here are concerned, and also to take care of the future development of this colony, which offers so many inducements to white settlers, and the government takes a keen interest in home industries—therefore the future of the iron and steel business in Australia gives every encouragement to the promoters of the enterprise.

The future of Australia is safe in the hands of its people and its rapid growth is assured. The iron and steel industry, already firmly established, will find ample inducement for extension in taking care of the future requirements of this new continent.

Government Sales of Triple Expansion Engines

Two hundred two unassembled 1400-hp. triple expansion marine engines, located in various parts of the United States, were sold by the United States Shipping Board June 19, for a total of $222,860, at public auction. Sidney Henry, director of sales of the Emergency Fleet Corporation, conducted the sale. There were approximately twenty bidders.

The engines were sold in lots as follows:

Thirty-three at Erie, Pa., to the Emerman Co., Erie, for $1,150 each.

Thirty at Tacoma, Wash., to H. D. Humphrey, Portland, Ore., for $1,260 each.

Thirty-one at Beaumont, Tex., to American Iron & Metal Co., Dallas, Tex., for $805 each.

Fifty at Corliss, Wis., to Leopold Cohen Iron Co., Chicago, for $1,095 each.

Fifteen at New Orleans, La., to Louis Greenspon, St. Louis, for $1,007 each.

Eleven at Alameda, Cal., to Hyman Michaels Co., Chicago, for $1,220 each.

Thirty-two at Hog Island, Pa., to J. C. McEvoy, Philadelphia, for $1,215 each.

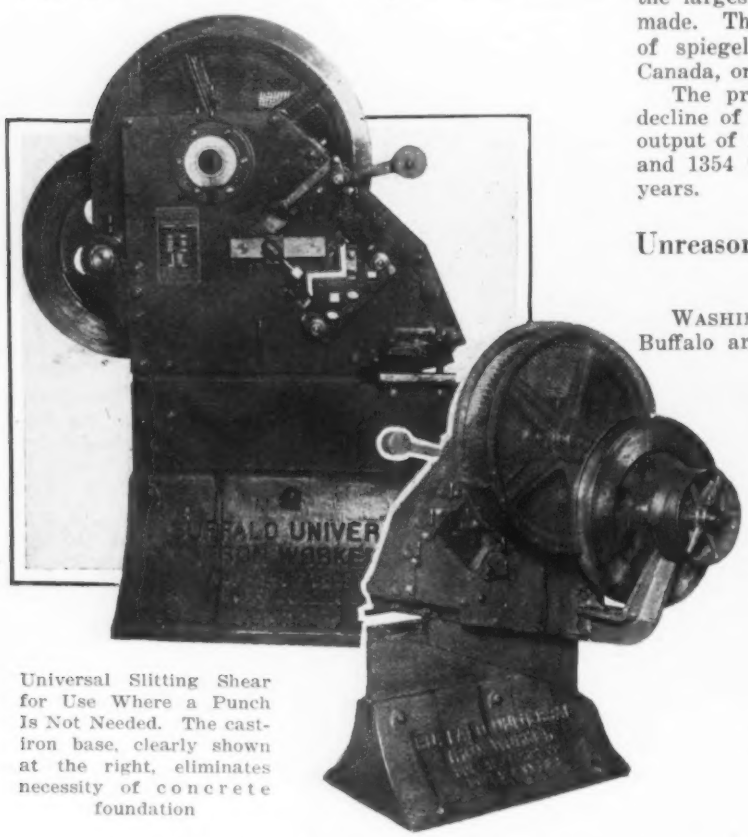
Competitive examinations for junior engineer in the United States Coast and Geodetic Survey will be held in June, August and October. Applicants should apply to the United States Civil Service Commission, Washington, for form 1312, stating the title of the examination desired.

Universal Slitting Shear and Bar Cutter

A universal slitting shear and bar cutter constructed as shown in the accompanying illustrations and intended particularly for use where a punch is not needed, as in warehouses, etc., has been placed on the market by the Buffalo Forge Co., Buffalo.

The length of the machine is 5 ft. 4 in., the width 2 ft. 8 in., and the height 6 ft. 4 in. The weight is 4500 lb. The power required to operate the machine at capacity is approximately 3 hp. The frame is of "armor-plate" construction and bearings are bronze lined. The drive shaft runs in oil ring-bearings. The gear and pinion are cut from semi-steel blanks. A feature of the machine is its cast-iron base, which is intended to eliminate the necessity of a concrete foundation.

The shear is equipped with 10 in. knives for cutting plates ½ in. thick, of any length and width, or 6 by ⅝ in. flats. The knives may be operated at 30 strokes per minute. The bar-cutter has standard five-piece knives to cut sizes as follows: 4 by 4 by ⅜ in. angles, square; 3 by 3 by ¼ in. angles, 45 deg. mitre, left or right hand; and 3 by 3 by ⅜ in. tees, square. The knives will also cut round bars up to 1⅝ in. in diameter and square bars up to 1½ in.



Universal Slitting Shear for Use Where a Punch Is Not Needed. The cast-iron base, clearly shown at the right, eliminates necessity of concrete foundation

With special knives furnished by the company the bar cutter will take 5 in., 9.75 lb., beams and 5 in., 9.00 lb. channels, or other rolled section of the same weight and area. One set of blades shears both channels and beams of the same size; a pair of knives being required for each size.

Promoting Trade by Radio

Foreign trade news and dispatches by radiophone will be another means of informing the American business man of developments in foreign fields of industry and commerce if the innovation to be made by the United States Department of Commerce on July 11 and 12 is to be established as a permanent practice.

On those dates two large gatherings of business men will be held at Boston and Baltimore; the exposition of New England Shoe and Leather Association will take place at the former city, while an import and export exposition will be held in the latter. Arrangements have been made with the Navy Department to utilize the facilities of the Arlington radio station to send these meetings the latest cabled news of foreign markets and trade opportunities received from abroad by the Department of Commerce.

For the guidance of all receiving stations, the time of broadcasting will be 8 p. m. (Eastern standard time) on two days, July 11 and 12, the station Arlington (NAA), and the wave length 2650 meters.

Low Canadian Iron and Steel Output in May

In its monthly report the Dominion Bureau of Statistics, Ottawa, says: The production of pig iron during May declined to the lowest level which has been reached in several years. The total was 23,363 gross tons, a decrease of 9209 tons from the April production. The record for the corresponding month last year was 56,091 tons. About 73 per cent of the May production was foundry and malleable iron, intended for direct sale. An interesting development was the increase in the output of ferroalloys, at 3397 tons or the largest since January, 1921, when 3941 tons was made. The output was augmented by the 2499 tons of spiegeleisen. Out of a total of 20 furnaces in Canada, only three were in operation during May.

The production of steel during May registered a decline of 4,935 tons below the April output, the May output of 17,000 tons comprising 15,646 tons of ingots and 1354 tons of castings; it is the lowest in recent years.

Unreasonable Fuel Rates Charged by Buffalo Consumers

WASHINGTON, June 27.—Rates on coal and coke to Buffalo are relatively unjust and unreasonable, compared with ex-lake iron ore rates and the latter are non-compensatory and are relatively too low as compared with the rates on fuel to Buffalo, according to a brief filed last Thursday with the Interstate Commerce Commission on behalf of iron and steel producers in the Buffalo district. This deals with what is known as the Lackawanna Steel Co. case. It is charged that the rate situation as it applies to ore from the lower lake ports and coal from the Reynoldsville, Pittsburgh and Connellsville districts in Pennsylvania to Buffalo creates an undue prejudice and disadvantage to Buffalo producers and favors interior competitors. It is declared that the ex-lake iron ore rate adjustment is repugnant to the principles of relative equality and fair treatment "which the Interstate Commerce Act was primarily designed to promote and secure and should in this proceeding receive the unequivocal condemnation of the commission." It is contended that the situation should be remedied by prescribing just and reasonable rates on coal and coke to Buffalo and fixing reasonable minimum rates on ex-lake iron ore.

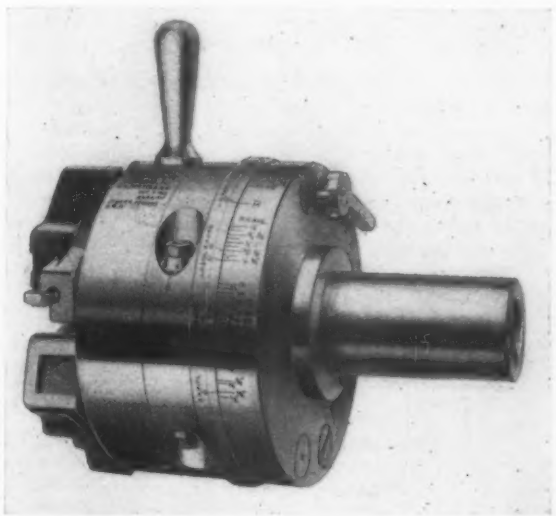
Opposition to the attitude of the Buffalo interests was set forth in briefs filed by iron and steel producers in the Pittsburgh and Youngstown districts and by the railroads. The brief of the Youngstown Sheet & Tube Co., et al., declared that rates on coal and coke to Buffalo have never been in relation to rates on ex-lake ore and said that conditions governing the ore coal traffic involved are different. The only theory on which rates on coal and coke to Buffalo can be made with relation to ex-lake ore rates to interior furnaces, it is stated, is the equalization of assembling cost theory, which has been condemned by the commission. A similar argument is made by Pittsburgh makers.

The brief of the carriers, not including the Bessemer & Lake Erie Railroad, asserted that the complainants failed to prove: That the present rates on ex-lake ore from Lake Erie ports are unreasonably low; that such rates fail to bear their proper proportion on transportation expenses, this throwing a burden upon rates on coal and coke to Buffalo. Evidence, it is said, shows that instead of the defendants "trying to rob Buffalo that city under all the increases in rates since 1917 has had 29c. less increase per ton than Pittsburgh."

New Automatic Die Head

A new type automatic screw-cutting die head in which the chasers are supported on the face of the head, permitting of easy access to those parts when it is necessary to remove them for grinding and changing from one size to another, has been placed on the market by the Landis Machine Co., Waynesboro, Pa. The head is applicable to practically all makes of screw machines and turret lathes having sufficient space to swing heads of these diameters. The illustration shows the 1¼, 2 and 3 in. size.

The head is opened automatically by retarding the forward motion of the carriage, and is closed by hand and is locked by the engagement of two hardened cylindrical lock pins in hardened bushings. The roughing and finishing cuts are obtained on the 1¼, 2 and 3 in. heads by the movement of the lock pin lever. When



The Chasers Are Supported on the Face of the Head, for Convenience in Changing

cutting threads in one pass, both lock pins are engaged and when in two passes, both pins are engaged during the first cut and one lock pin during the second cut. This is controlled by the lock pin lever shown.

The head is adjusted to size by an adjusting screw which engages the head body. The operating, adjusting and closing rings remain in a fixed position when the head is closed, and the rotating of the head body within these rings gives the diameters within the range of the head. It is graduated for all sizes of bolts, both right and left hand, and right-hand pipe within its range. In adjusting the 1¼, 2 and 3 in. heads for left-hand threading, the lock pin lever is reversed.

The chaser holders and trunnions on the ⅝ and ⅞ in. automatic heads are integral. The one set of chaser holders provided with the head is suitable for threading bolts and pipe within its range. When pitches and diameters other than U. S., V., S. I., Whitworth and Briggs standards are to be threaded, special chaser holders with trunnions integral will be supplied. The chaser holder and trunnion may be removed by merely removing the shank and loosening one screw. These heads are not equipped with any kind of roughing and finishing attachments.

The chaser holders and trunnions provided for the 1¼, 2 and 3 in. automatic die heads are separate. Unless otherwise specified the die heads are equipped with right-hand bolt chaser holders for cutting U. S. standard diameters and pitches. These heads are equipped with roughing and finishing attachments.

This type of head employs the Landis long life chaser and can be equipped with shanks to meet individual requirements.

May Structural Sales at 82 Per Cent

WASHINGTON, June 20.—Sales of fabricated structural steel during May amounted to 82 per cent of fabricating capacity, according to reports made to the Department of Commerce by firms comprising 70 per cent of the fabricating capacity of the United States. The May business reported by 82 firms, having a capacity of 130,600 tons, totaled 106,620 tons as against April sales of these same firms amounting to 121,211 tons, or at the rate of 93 per cent of capacity.

Total sales throughout the United States, based on the reported percentage and a total capacity of 180,000 tons, amounted to 146,900 tons in May, while revised figures for April give a total of 165,900 tons. The April figures are based on reports from 87 firms, having a total capacity of 132,600 tons, whose sales amounted to 122,198 tons, or at the rate of 92 per cent of capacity.

Just as April was a record in total volume as compared with April over the last ten years, so the May volume was also larger than any year since 1911.

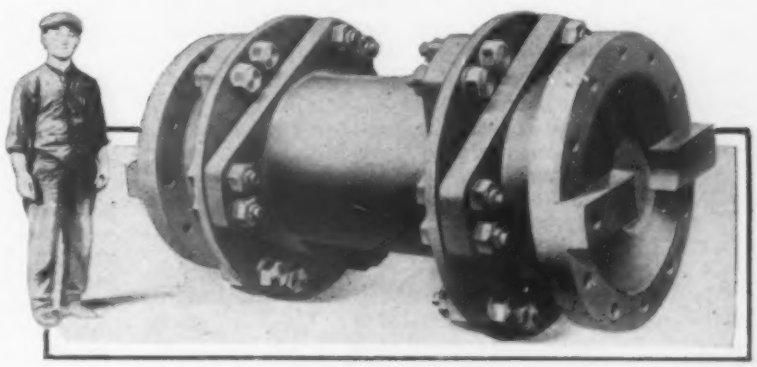
Manganese Ore from Russia

The 1913 output figures of manganese ore in Russia were, says the *Metal Bulletin:* Caucasia 750,000 tons, South Russia 240,000 tons, and the Urals 2500 tons. Fighting between the Reds and Whites in South Russia and Caucasia caused a suspension of work there, with the result that the Soviet Government was forced to concentrate its activities on the Ural mines, which, indeed, in 1920 produced some 6600 tons. On Jan. 1, 1921, the stocks there amounted to 6400 tons, and production during the year amounted to about 6800 tons. For the present year only about 6250 tons are expected to be mined in the Urals, but it is planned to resume operations in the South to compensate for this.

Large Flexible Coupling

What is said to be the world's largest flexible coupling is that shown in the accompanying illustration, installed recently by the Thomas Flexible Coupling Co., Warren, Pa., at one of the plants of the Brier Hill Steel Co., Youngstown, Ohio. The length of the coupling is 10½ ft., the diameter 5 ft. and the weight 14 tons.

The coupling is used to connect a Westinghouse mill motor to a 132 in. plate mill, and has a capacity of 10,000 hp. at 100 r.p.m. with a factor of safety of five. The parallel misalinement capacity is ½ in., and



Flexible Coupling Used on 132-In. Plate Mill. The length is 10½ ft., diameter 5 ft. and the weight 14 tons

end-wise float capacity, in direction of its axis, 1 in.

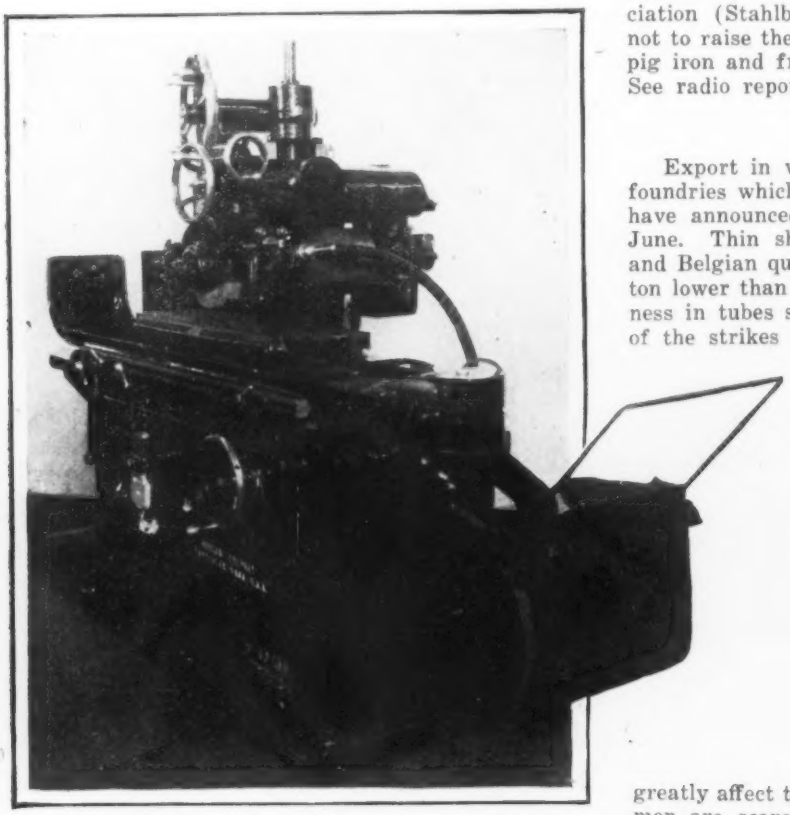
In this design of coupling between two end-flanges is interposed a center member, this being connected to the flanges by laminated flexible steel disk rings, which in turn are bolted alternately to the center member and the end flanges. The disks are circle rolled and specially treated to insure long life without crystallization. Successful operation of this mechanism under conditions of severe misalinement of shafts practically outside normal requirements, is claimed, together with unusual end-wise float under full load.

New Surface Grinding Machine

A 6 x 10 x 36 in. surface grinder as shown in the accompanying illustration has been added to its line of open-side surface grinding machines by the Norton Co., Worcester. The new tool is a production-precision machine.

A feature of the new design is the improved spindle bearing construction with flood lubrication and thumb screw adjustments by which sticking of the wheel spindle is said to have been eliminated. The spindle requires no attention once the thumb screws are adjusted while the spindle is rotating at its normal speed.

Other features include compactness of design, convenience of operation and high table traverse, intended to assure high production. The latter feature is emphasized by the size of the wheel and the diameter and width of the spindle pulleys, these being of ample size to utilize the 15 hp. driving motor. The motor is mounted on the base of the machine. The grinding lubricant is contained in the portable tank shown, which is designed to be cleaned in a few moments without serious interruption of production.



Improved Spindle Bearing Construction with Flood Lubrication and Thumb-Screw Adjustments, by Which Sticking of the Spindle Is Eliminated, Are Features. The grinding lubricant is contained in portable tank shown at right

The finished table surface is 6 x 36 in., and work 8½ in. wide may be ground. The height from the table to the lower side of the wheel, 10 in. in diameter, is 10 in., plus ¼ in. for clearance. The floor space occupied by the machine is 10 ft. 8 in. by 5 ft. 3 in. including the extreme overhang of the table at either end, and the height is 6 ft. 3 in. The weight of the machine is approximately 6500 lb.

The two-speed hand cross slide has a ratio of 1 to 38 and the vertical slide an index feed of 0.00025 in. The speed of the table is 80½ ft. per min. The hand table traverse engages automatically when the power traverse is thrown off. The standard grinding wheel is 10 x 3 x 3 in. and the counterbore 5½ x ¾ in., both sides. The flanges are 5¼ in. in diameter.

The surface speed of the grinding wheel is 3515 ft. per min. and the speed of the wheel spindle 1342 r.p.m. The spindle pulley is 8½ in. in diameter, the belt 4 in. wide and the speed of main drive shaft 815 r.p.m. The spindle bearings have flood lubrication and thumb screw adjustment.

German Iron and Steel Trade

BERLIN, GERMANY, June 13.—German export business in iron and steel remains dull. German works claim to be unable to meet foreign competition on a price basis, but are also requiring a longer time for delivery, and some orders have been cancelled.

The value of the mark has not decreased to the same extent within Germany as abroad, and the German manufacturer has not only the advantage of cheaper inland raw materials but he is also paying less for labor than most of his foreign competitors. Some manufacturers are raising their prices on the plea of increased cost of production and the fresh railroad rates increased 25 per cent on June 1. The Steel Association (Stahlbund) has, however, just again decided not to raise the prices in spite of the higher prices for pig iron and freight. [Prices have since been raised. See radio report in another column.—*Editor.*]

Iron Castings Higher

Export in wire and iron castings continues. Iron foundries which had raised prices 15 per cent in May have announced another increase of 10 per cent for June. Thin sheet exports are almost dead. British and Belgian quotations are 2000 to 3000 m. per metric ton lower than those of German works. Foreign business in tubes shows no improvement. The settlement of the strikes and lockouts in the south of Germany has resulted in a greater demand for semi-finished material.

The coal question is still acute and the lack of fuel retards production in the iron and steel industry. Over 700,000 tons of British coal were imported during May. Negotiations for an increase in the output of coal have been conducted. The mine owners have proposed an agreement for additional hours to be worked. Though this was supported by the government and the men's leaders, it was rejected by a representative meeting of the miners' union. Hopes are expressed on all sides that serious troubles may be averted, but there is the possibility of further complications, which will greatly affect the iron and steel industry. Skilled workmen are scarce, as the building trades, the chemical industry and others are paying higher wages than the mines and the iron works.

Other Prices

German works east of the Rhine are slow in delivering. Their prices are about 1366 marks for shapes, 1387 m. for merchant bars, 1521 m. for hoop iron, 1531 m. for thick sheets, 1701 m. for medium, 1787 m. for thin sheets (No. 11 to 20 U. S. A. sheet metal gage), and 1847 m. for sheets thinner than No. 20, all prices per 100 kg.

Several works in Westphalia have established the Central Iron Co., for buying material for all the works connected. The firms of Phoenix A. G. in Hoerde, the Rhenish Steel Works in Duisburg-Meidenreich, the Steel Works van der Zypen & Wissen, and the firm of Otto Wolff & Co. have founded a new company with a capital of 50 million marks, under the name of Iron Export Otto Wolff & Co. in Cologne. The new firm is taking over the whole export trade of the four firms.

At the annual meeting of F. J. Ryan & Co., industrial furnace engineers, Philadelphia, held at the company's new offices in the Wesley Building, that city, F. J. Ryan was re-elected president; W. W. Posey, president Lancaster Iron Works, Lancaster, Pa., was elected vice-president, and A. C. Scully, treasurer Lancaster Iron Works, was elected treasurer. G. F. Beach was retained as chief engineer of the Mires furnace departments of the Ryan company. Additional departments have been decided upon in the line of producer gas and regenerator furnaces under the direction of Karl G. Gustafsson, who has had experience in this line of work in Germany and France.

HORIZONTAL BORING UNIT

Table-Type Boring, Drilling and Milling Machine —Heavy Construction and Other Features

The Pawling & Harnischfeger Co., Milwaukee, has placed on the market the table-type horizontal boring, drilling and milling machine shown in the accompanying illustrations. It is designated as the No. 3-T, and is intended for tool room as well as production work.

It is claimed that under tests an operator milled a surface 22 in. square within 0.001 in. of flat, measured with a straight edge. This is said to have been made possible by the use of square lock, narrow guides with taper gibs and unusually heavy construction of the spindle, saddle and column, coupled with scraped sliding fits.

Centralized control is a feature, levers and hand wheels being conveniently arranged for the operations required. Control of feeds or speeds, by hand or power, is accomplished conveniently by the operator without moving from his position. The movement of all levers are interlocking and there cannot be two conflicting speeds or feeds in action at the same time.

The spindle-carrying saddle is of box section, well ribbed and can be handled at any one point when fully assembled, without distortion. Drive gearing and shaft bearings and phosphor-bronze bushed. The main spindle sleeve bushing is also of phosphor bronze, scraped to a slight taper for readily taking up wear of the spindle driving sleeve. The saddle is guided upon the column by a narrow guide, placed at the front nearest the cutting pressure. Adjustment for wear is made by two steel taper gibs. The screw for feeding is placed near the guide. The saddle is raised or lowered by hand wheel, power feed or quick traverse.

The column is of box section and is tongued and grooved to the bed. The bed is cast in one piece with the section under the column and is well ribbed. It contains chutes for quick removal of cuttings and contains also the feeding mechanism, feed distributing mechanism and the rapid traverse. The platen table is a heavy box casting, and is scraped to the bed with a narrow guide and taper gibs. It contains the feed mechanism for the platen, which is a box casting well ribbed, of deep section and has an unusually heavy top section. The platen is equipped with an automatic feed trip and is scraped to its table with a narrow guide and steel taper gibs.

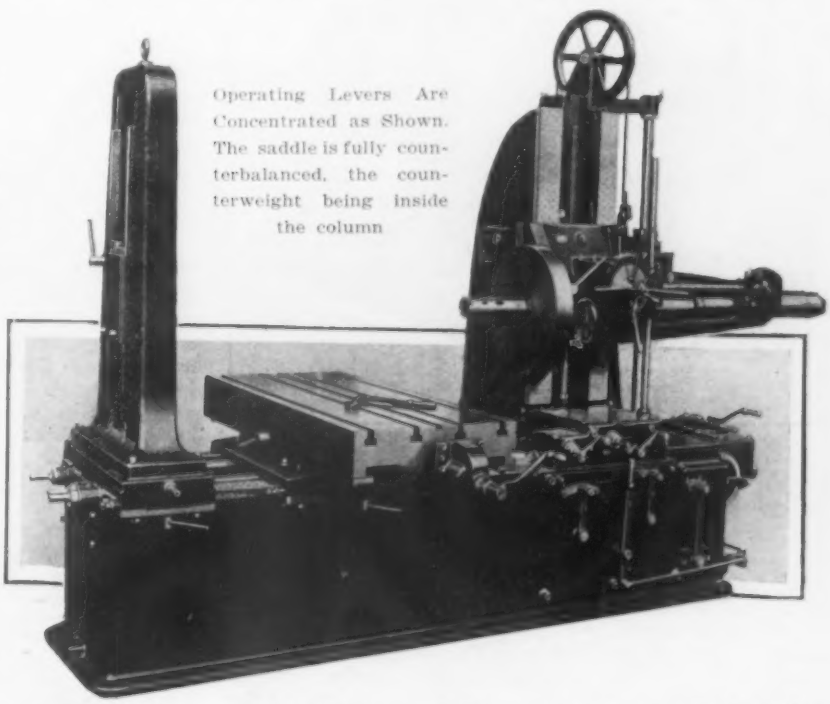
The spindle is 3 in. in diameter and is of high carbon alloy steel forging, ground to a sliding fit in its driving sleeve. Power is applied at the front end, and the feed at the rear-end through a rack and pinion. The spindle has large bearings, front and rear, equally spaced at any point of its travel. It is moved through its changes of feed by spur gears and positive clutches, actuated through a frictional worm wheel. The front end is bored for a No. 5 Morse taper and contains the slots for driving milling cutters and boring bars.

The drive is delivered to the spindle through a small plate with a wide face, coarse pitch gear or a larger face plate with internal gear and tapped holes for the attachment of milling cutters and facing heads. The spindle driving sleeve is of semi-steel and is ground to a taper fit in its bushings to compensate for wear. It is equipped with adjustable bronze taper shoes for taking up the wear caused by the sliding of the spindle in its sleeve.

The machine is driven either by belt directly from the line shaft or by a 5-hp. constant-speed motor attached to the base at the rear. Sixteen spindle speeds ranging from 14.5 to 225 r.p.m. with small face plate, and 8.7 to 136 r.p.m. with large face plate, are provided. Eight geared feeds ranging from 0.005 to 0.288 in. per revolution of the spindle for boring, and from 0.0084 to 0.44 in. for milling, when using small face plate. By using the large face plate the feeds range from 0.008 to 0.48 and 0.013 to 0.73 for milling. The rate of feed is the same for every part to which it is applied and not more than one feed can be engaged at one time.

The boring-bar support can be removed from its base without disturbing any of its mechanism. Helical gearing is used between its screw and the saddle screw so as to have a minimum of back lash. A thread chasing attachment can be provided to cut threads from 2 to 16 per in. A circular swiveling table, graduated in minutes and having hand or power feed can be provided, and also an auxiliary table, to support long work. A Star feed facing head which will face up to 16 in. in diameter can be clamped to the spindle or bolted to the face plate.

The travel of the spindle is 23½ in. The maximum distance between the face plate and the outer support for boring bar is 5 ft. and the distance from top of platen to center of the spindle is 28 in. The platen is 24 by 54 in., and the amount of cross feed to the platen is 36 in. with automatic trip. The weight of the machine is approximately 11,300 lb.



Operating Levers Are Concentrated as Shown. The saddle is fully counterbalanced, the counterweight being inside the column

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The metal working and allied industries of New England are now comparatively free from labor troubles. The strike of foundry employees in and about Boston was a decided fizzle, virtually every plant involved having obtained sufficient help to keep up with orders. The H. B. Smith Co., Westfield, Mass., heating appliances, is deadlocked with striking employees, and is practically the one spot in this territory where production has been checked by labor troubles. Machine shops generally report no trouble in securing all help needed. The reduction in wages during the past two years for machinists has been comparatively small. In railroad car repair shops, the general opinion is there will be no nation-wide strike of carrier employees.

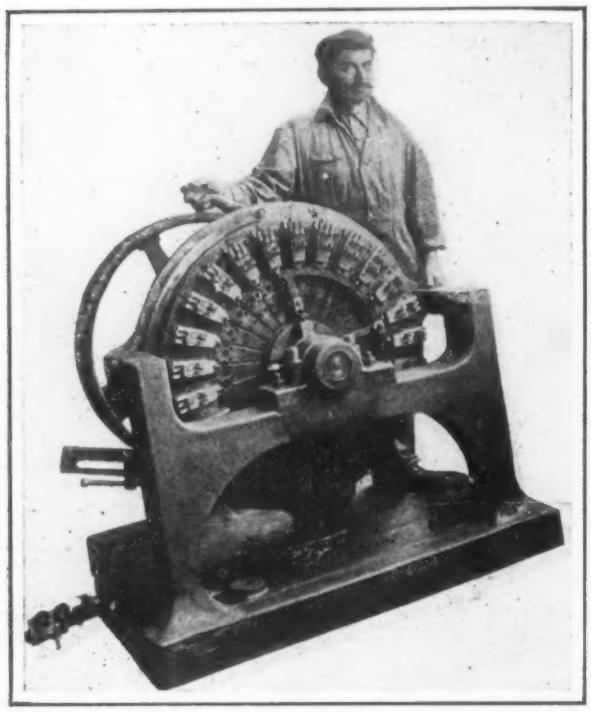
The Interstate Commerce Commission has denied the request of Youngstown, Ohio, shippers that freight rates to Oklahoma, Texas and other southwestern steel consuming points be suspended because of alleged inequalities giving competing producing districts an advantage in shipping.

MACHINE FOR FORMING WIRE

Designed for Products of Open Ring Form—Unusual Output Claimed—Construction Outlined

The wire forming machine illustrated has been received from France by the Riverside Machinery Depot, Detroit, on which manufacturing and selling rights for the United States have been secured. It is the invention of M. Francis Athimon, and is claimed to have specially high production capacity.

The machine makes split cotter pins, spring washers, thimbles, pipe collars and other articles of wire



Machine for Making Products of Wire or Sheet Metal the Form of Which Corresponds to an Open Ring

or sheet metal the form of which corresponds to an open ring.

It is designed to operate continuously and comprises rotating disk plates provided with a series of identical operating devices or dies, each consisting of a system of knives, mandrel and cams driven by suitable gradients and recoiling springs. The knives first act as feeders for the wire or sheets, then cut the material to the desired length. The operative members of the machine are changed according to the character of article desired, the disk being arranged to accommodate dies for the various products.

The component members of the machine are the rotating plate or disk, mandrel and mandrel-holders located in the plate or disk, fixed gradients actuating these members, wire or sheet cutting devices secured in the intervals between the mandrels, first fastening and driving the wire or sheet before progressively cutting it, and a reel located on the frame for supplying material as used.

The illustration shows the machine set up for making cotter pins, and it consists of two disks assembled on cheeks on the shaft, a peripheral groove being provided; the groove extends radially to a certain depth between the disks, which together form a rotating plate. Inside these disks are bored a suitable number of cylindrical openings to receive the mandrel-holders and the springs intended to push the holders outside of the openings. The outside part of the mandrel-holders is provided with a yoke and a roller for reducing the friction on the gradient. Inside of the holders is screwed a socket, in which is located the mandrel.

The mandrel consists of a cylindrical part provided with a yoke and a roller and of a finger, constituting the properly called mandrel. A spring continuously pushes the whole against the gradient. At the lower part of the mandrel-holder is secured a semi-cylindrical opening intended to receive the finger mandrel in a certain position. In a groove are located, in a corresponding number, blocks of similar cams and in the side-wall the axles of the cams. The cams are kept open by springs.

Between the blocks of cams are secured the knives, made of two parts, one fixed, the other movable. The movable part slides in the disk and is outwardly pushed by a spring on the gradient. The movable knives are alternately placed frontward and backward with reference to the direction of rotation of the machine. The sections of wire after being cut are thus parallel to the plane of rotation. The whole machine, except the gradients, is rotatable, and the wire of convenient thickness, is unwound from a reel and continuously feeds the machine.

During rotation the knives progressively close and insure the driving of wire, then successively close and open, finally opening, these movements being caused by the gradient. The mandrels move in and out of the groove, the mandrel-holders progressively move toward the cams and are finally removed and stay in such positions, all these movements being assured by the gradient. The successive movement of cams, mandrels and knives, produces a given number of cotter pins or any other articles in one revolution.

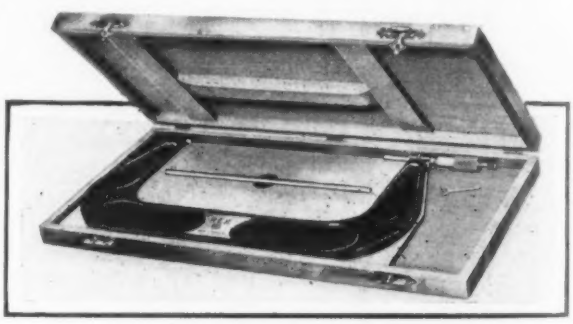
Three sizes of machines will be placed on the market, varying from a small machine to one of almost unlimited capacity, as the number of articles produced in one revolution is only limited by the number of dies provided.

New Line of B. & S. Micrometers

The Brown & Sharpe Mfg. Co., Providence, has brought out a new line of micrometers, konwn as the Rex, and intended to afford a high grade precision tool at a low price.

The new line is for either English or metric measure and includes 24 sizes to take measurements up to 24 in. or 600 mm. The tools are regularly equipped with a clamp ring which clamps the spindle and preserves the setting.

A feature is the rectangular shape of the frames which gives greater measuring capacity than frames



Rectangular Frames Give Greater Measuring Capacity

of the circular type. Holes in the larger sizes serve to lighten the frames. The anvil, spindle and other parts are similar to the company's regular micrometers and means are provided for adjusting for wear of the measuring surfaces and screw. In the larger sizes a substantial wooden case is provided for the tool, as shown.

The Laconia Car Co., Laconia, N. H., has completed its $500,000 car repair order for the Maine Central Railroad, and is working on a $1,000,000 similar order placed some time ago by the Boston & Maine Railroad. The company has sufficient business on its books to keep its car repair shops busy the rest of 1922, but comparatively little work for its foundry.

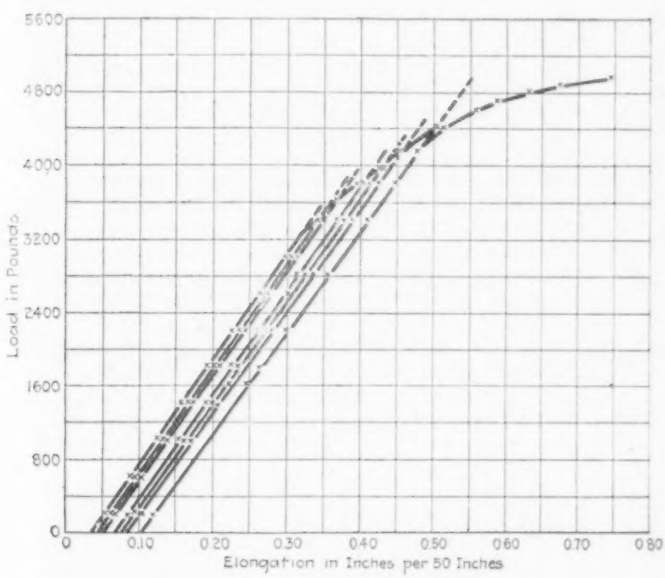
The Collins Co., Collinsville, Conn., cutting tools, etc., is employing twice as many people as it was six months ago.

Elastic Properties of Small Wire Cable

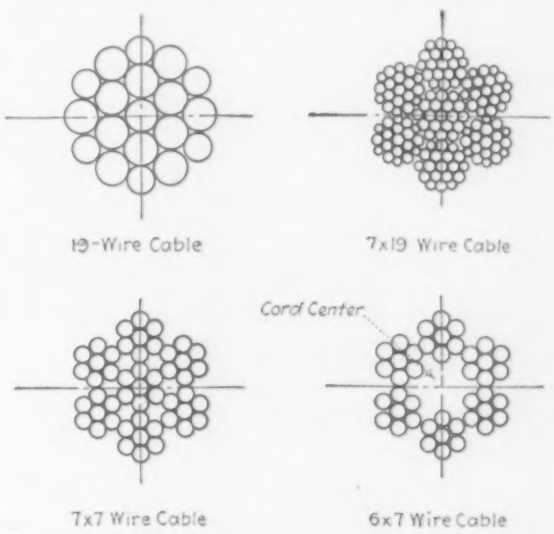
Variation by Type of Cable Greater Than Total Value Given in Current Handbooks—Difficulties in Measurement Due to Cable Characteristics Under Tension

BY R. R. MOORE*

DEVELOPMENT of aircraft has brought into use several varieties of small diameter steel cable, a knowledge of the physical characteristics of which is important for efficient design. Such information becomes vitally important to engineers concerned with the development of new types of aircraft and the advancement of the science of aviation in general. This is the case at the engineering division of the Air Service, located at McCook Field, Dayton, Ohio. The subject was first brought to the attention of the material section by a request from the design section for stress-strain curves on various sizes of the 19-wire non-flexible type of aircraft cable. After completing these tests the investigation was extended to cover all available types of cable used in air plane construction.



Rise in Elastic Limit of $\frac{1}{16}$-In. 19-Wire Cable Made of Non-Flexible Steel Wire



Types of Cable Construction, Showing, in 19-Wire and 7 x 19 Wire Cable, the Presence of Small Alternate Outside Wires, to Provide a Form More Nearly Cylindrical Than Is Possible When All Wires Are of the Same Size

Engineering handbooks do not quote any value for the elastic limit of wire cable, and for the modulus of elasticity they give a value of about 12,000,000. This value, however, refers to wire ropes with hemp centers and for sizes greater than ⅜ in. In aircraft work we are mostly concerned with ropes made of high strength steel wire in sizes less than ⅜ in., and types which have either a wire or wire-strand center. The value for the modulus of this type of cable is considerably greater than 12,000,000.

While the determination of ultimate strength is a comparatively simple matter, the accurate measurement of elongation necessary in determining the elastic limit and modulus of elasticity presents several difficulties. In the first place, the fact that the cable is built up of so many small wires and strands makes it difficult to locate accurately a definite gage point and attach an instrument there without its shifting in position. It is evident that the usual type of extensometer with pointed screws for grips is of no use for this work. In the second place, a cable twists when under load, so that no rigid instrument can be used.

Tests were made on a 20,000-lb. Olsen structural-material and airplane-parts testing machine, which was previously calibrated and found to be in good adjustment. However, in several cases the measurement of load was obtained from the deflection of an accurately calibrated spring, placed on the upper head of the machine and arranged so as to take the load applied to the cable. The deflection of the spring was measured with an Ames dial reading to 0.001 in.

This method gave more consistent results, because it was considerably more sensitive to small variations in load than the lever system of the testing machine. In fact, some such arrangement is absolutely necessary in testing small cables, particularly the 1/32, 1/16, and 3/32-in. sizes, in order to obtain the elastic limit and modulus with any degree of accuracy. To obtain the breaking load, however, the spring must be removed and the load measured on the machine.

The instrument used was similar to the familiar wire-wound dial type of extensometer. The greatest difficulty was in attaching the dial to the cable at the gage point. This was accomplished by attaching the dial to a specially devised clamp. At the other gage point, a second clamp was attached similar to the one holding the dial. To this clamp one end of a fine magnet wire was attached; the wire extended down the cable and around the brass drum, the loose end having a light weight attached to it. It is clear, then, that as the two gage points moved apart the wire turned the drum and shaft upon which the needle was mounted, thus recording directly on the dial the elongation of the cable.

To reduce the error occurring from this twisting, the wire was placed as near the cable as possible and hardly exceeded ½ in. from the center of the cable at any time. As the maximum twist noted did not exceed 90 deg., the error incurred in the modulus due to this error of elongation is negligible.

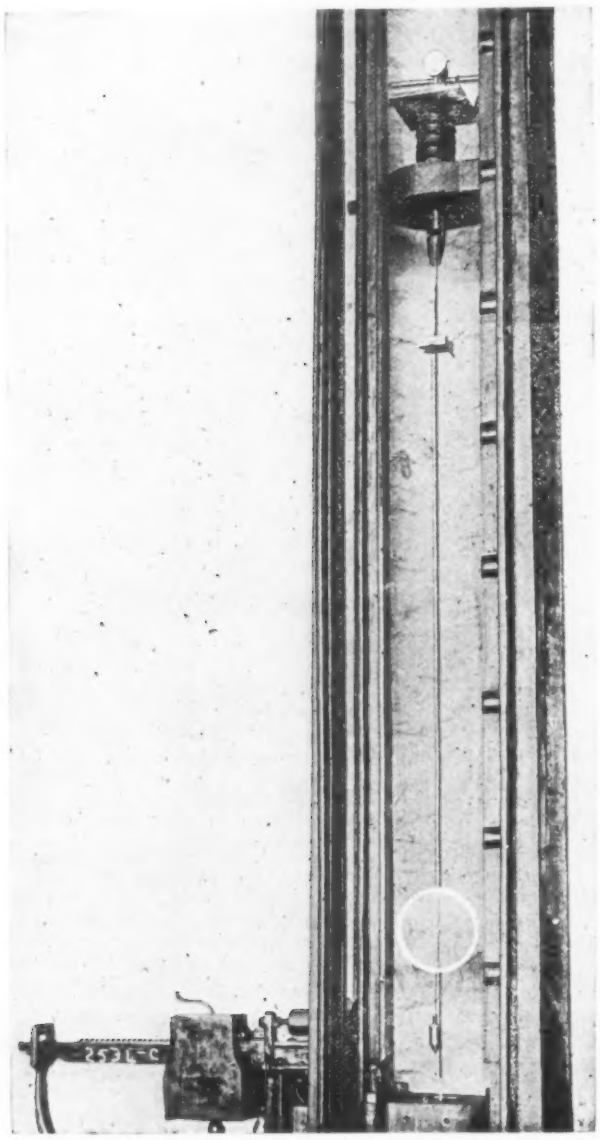
Cables of four different types of construction and one made of phosphor-bronze wire were tested, the types and sizes tested being given in Table I. A chemical analysis of several wires taken from the phosphor-bronze cable gave the following composition: tin,

*Chief, Physical Testing Branch, Material Section, McCook Field, Dayton, Ohio.

Abstract of paper presented before American Society of Mechanical Engineers.

3.77; copper, 95.60; zinc, 0.34; phosphorus, 0.28 per cent. A chemical analysis of several wires from the steel cables gave the following composition: carbon, 0.64; manganese, 0.55; phosphorus, 0.033; sulphur, 0.033 per cent.

Stress-strain curves for computing the modulus and locating the elastic limit were plotted on cross-section paper with a scale of 1 in. equal to 0.01 in. actual elongation in 50 in. The vertical scale was made so as to give the curve a slope of about 45 deg. with the horizontal. This large-scale plotting showed the readings of the extensometer to be very consistent, indicating that the cable was stretching uniformly and also twisting uniformly.



Complete Set-up of Apparatus, with Extensometer Attached

The values for elastic limit were obtained by selecting the highest point on the straight-line section of the stress-strain curves. Strictly speaking, this is not the elastic limit but the proportional limit: (American Society for Testing Materials.) However, as the majority of practical designing engineers use the term "elastic limit" to designate what is actually the proportional limit, we have also used it in that sense in order to avoid confusion.

There is considerable variation between the modulus of different sized specimens of the same type. To show the comparative modulus values for the different types of cable, Table II was prepared, selecting the same size of cable from each type, as nearly as it was possible to obtain.

There is in several cases quite a difference between the first-run modulus obtained on different specimens of the same cable. The largest of these differences is in these ⅛-in. 7 by 19 cable, specimens 13 and 14, which show a difference of about 3,200,000; and the 6 by 7 cable, specimens 16 and 40, which show a difference of 2,760,000.

The highest modulus obtained on any cable is 27,793,100. This value was obtained after loading below the elastic limit. It should be remarked here that this value is more than twice as large as the value 12,000,000 commonly quoted for wire rope.

The largest increase in modulus is found in the ⅛-in. 7 by 19 cable, which shows an increase of 6,600,000 after loading above the yield point. It is noticeable that this maximum increase occurs on the smallest-sized cable. The phosphor-bronze cable shows the smallest increase in modulus of any of the cables, even though it is of the same type of construction (7 by 19) as the one which showed the greatest increase.

Table I. Types and Sizes of Cables Tested

Type	Material of Wires	Protective Coating on Wires	Diameter of Cable
19 wire	Steel	Tinned	3/32*, 1/16, 3/16, 1/8, 5/32, 3/16
7 by 7	Steel	Zinc-plated	1/16, 3/32, 5/32
7 by 7	Steel	Tinned	3/16
6 by 7	Steel	Zinc-plated	5/64
7 by 19	Steel	Tinned	1/8, 5/32, 3/32, 9/32, 11/32
7 by 19	Phosphor-bronze	None	7/32

*This cable has only 7 wires because of its small size.

Table II. Comparative Modulus Values for Different Types of Cable

Type	Size	Average First Run Modulus	Average Modulus After Loading Above Yield Point
19 wire	3/32	24,870,000	25,687,000
7 by 7	3/32	19,505,000	22,985,000
6 by 7	5/64	17,989,000	20,660,000
7 by 19	3/32	15,605,000	20,112,000
7 by 19*	7/32	11,307,000	11,953,000

*Phosphor-bronze.

While it is true that the modulus is raised a greater amount by loading above the yield point than below the elastic limit, it is to be remembered that a very large part of this increase is due to the loading below the elastic limit. It is evident, then, that the net effect of loading above the yield point is small.

The final object of this investigation was to determine whether it is possible to raise the elastic limit by loading a little beyond this point. The results of one set of runs made to show this are given in curves which indicate definitely that the elastic limit can be considerably increased. The amount of increase obtained on the cables tested is as given in table III.

Table III. Amount of Increase in Elastic Limit Obtained on the Cables Tested

Type	Size	Increase in Elastic Limit, Lb.	Per Cent Increase Over Original Elastic Limit
19	3/32	2,000	62
	1/16	1,000	33
7 by 7	3/32	250	63
6 by 7	5/64	240	30
7 by 19	1/8	400	36
	11/32	2,000	33

Conclusions

The modulus of elasticity of small size wire aircraft cable varies from 15,000,000 to 28,000,000, depending upon the size and type of the cable. The 19-wire cable has undoubtedly the highest modulus and the 7 by 19 cable probably the lowest. The maximum difference between moduli of specimens of the same size and type of cable may be as high as 3,000,000.

The modulus of elasticity may be raised by loading the cable below the elastic limit. The greatest increase, obtained on the 7 by 19 type, may amount to 6,500,000. Resting the cable did not seem to have any definite effect on the modulus.

The elastic limit may be raised by loading the cable a little beyond this point. The maximum increase obtained amounted to 63 per cent of the original elastic limit.

Leather Belting Sales Index

Sales of leather belting, covering about 60 per cent of the total production, are reported for the week ending June 10 at 99,116 lb. and $165,425. This compares with 87,745 lb. and $143,113 for the previous week and 66,267 lb. and $122,064 for the corresponding week in 1921.

Meeting of Electric Steel Founders' Research Group

Officers and operating officials of each plant holding membership in the Electric Steel Founders' Research Group held one of their regular meetings immediately following the Rochester convention of the American Foundrymen's Association, at East Aurora, N., Y., because of its accessibility to Rochester where the group members had participated in the foundrymen's annual meeting. C. R. Messinger of Milwaukee, who is active in this research group, was selected at Rochester as the next president of the American Foundrymen's Association.

This research group is made up of representatives of the Electric Steel Co., Chicago; the Fort Pitt Steel Casting Co., McKeesport, Pa.; the Lebanon Steel Foundry, Lebanon, Pa.; the Michigan Steel Casting Co., Detroit; and the Sivyer Steel Casting Co., Milwaukee. At the convention of the American Foundrymen's Association the results of comprehensive investigations in testing molding sand were presented by R. J. Doty, of the Sivyer company, who had been delegated by the group to carry on such a research for its own account. The group made some of its information on the subject available to the industry at large. The result of this, as announced at the foundrymen's convention, has aroused great interest, particularly as it was stated there that certain testing methods developed by the research group have been approved by the sub-committee on tests of the joint committee on molding sand research organized by the American Foundrymen's Association and the National Research Council, and participated in officially by the American Society for Testing Materials and numerous technical departments and bureaus of the United States Government.

It is stated that at East Aurora further steps for the group molding sand investigation were planned, and interesting reports were presented by the members on annealing, electric furnace practice, the elimination of slag in castings, and other matters that now engage the attention of the group members.

An Engineering Council in Cleveland

The Cleveland Engineering Society at a special meeting June 20, approved a plan to form an association of that society and the local sections of the national technical societies and other scientific and technical societies to be known as the Council af Associated Technical Societies of Cleveland. The object of the organization will be to coordinate the actions and further the aims of the various technical societies in Cleveland and vicinity. The proposed constitution provides for a council consisting of the president of the Cleveland Engineering Society as chairman ex officio and the chairman of each local section of a national engineering society or other associated organization. There are fourteen local sections of national technical societies in Cleveland and it is expected that most, if not all of these, will become affiliated with the council.

New York Steel Treaters

At the June meeting of the New York Chapter of the American Society for Steel Treating, held Wednesday evening, June 21, in the assembly room of the Merchants Association of New York, two brief addresses were delivered, which resulted in an interesting running discussion by the rather unusually large attendance. The subject of "Tool Room Troubles" was discussed by A. H. Kingsbury of the Crucible Steel Co. of America, Harrison, N. J. The other speaker was Sam Tour, metallurgist, Doehler Die Casting Co., Brooklyn, who discussed "Salt Baths."

Announcements of chairman for the standing committees of the coming year were made as follows:

Program committee, Sam Tour; membership committee, A. H. Kingsbury; entertainment committee, Paul F. McGovern of the General Alloys Co., New York; research committee, C. E. McQuigg, General Research Laboratory, Carbide and Carbon Co., Long Island City. The executive committee is made up of the foregoing chairmen; the three officers of the chapter; the retiring chairman, George L. Norris; and three or four others still to be appointed.

The chapter's next meeting will be held the third Wednesday in September and at this meeting brief abstracts of some of the principal papers to be presented at the national convention in Detroit in the week of Oct. 2 will be read and discussed.

Connecticut Foundrymen's Association

The annual meeting of the Connecticut Foundrymen's Association was held Tuesday evening, June 20, at the Seaside Club, Bridgeport. F. W. Stickle, Capitol Foundry Co., Hartford, president, was re-elected, as were the following officers and members of the board of managers: C. E. Bilton, Bilton Machine Tool Co., Bridgeport, vice-president; C. S. Neumann, Union Mfg. Co., New Britain, secretary; J. M. Woolson, estate of S. H. Barnum, New Haven, treasurer; B. W. Spencer, Bradley & Hubbard Mfg. Co., Meriden, A. F. Corbin, Union Mfg. Co., New Britain, F. B. Farnsworth, McLagon Foundry Co., New Haven, G. A. Ray, Taylor & Fenn Co., Hartford, and S. Reynolds, Putnam Foundry & Machine Co., Putnam, members of board of managers. The association is now entering its fourth year and has a membership of 45 concerns. Sand, for Molding, for Cores and for Sand Blast, was the subject discussed at the annual meeting.

Hearings to Standardize Gages

A public hearing by the American Engineering Standards Committee designated by Secretary of Commerce Hoover to establish standard manufacturing tolerances for industries using plug, ring and snap gages was held at the Hotel Winton, Cleveland, June 21, and was attended by about thirty manufacturers who approved the plan to standardize shop practices. Other hearings will be held in various industrial centers. The committee of which E. C. Peck, Cleveland Twist Drill Co., is chairman, expects to complete its report on standardization in about thirty days.

To Interest Engineers in Industrial Research

To arouse national interest in industrial research, Alfred D. Flinn, secretary of the Engineering Foundation and chairman of the division of engineering, National Research Council, left last week on a tour of several weeks to the Pacific coast.

Mr. Flinn goes as the emissary of organized research to enlist the aid of engineers of the Far West in a nationwide plan of industrial research in which the foundation, the council, government departments and the industries will link their efforts.

Scientific paper of the Bureau of Standards, No. 435, entitled, "Metallographic Etching Reagents: II, For Copper Alloys, Nickel, and the Alpha Alloys of Nickel," is an investigation which constitutes the second part of the general study of metallographic etching reagents. Specimens representative of all of the types of alloys in the copper-zinc system and of the industrial bronzes and of aluminum bronze were examined. The etching characteristics of brasses and bronzes are very similar to those of copper (Bureau of Standards scientific paper No. 399) in that oxidation plays a very important part. Nickel is etched with very considerable difficulty, contrast is usually lacking and pitting is apt to be excessive. A new reagent, concentrated hydrochloric acid, is described for etching this material by means of which very superior results may be obtained. The alpha nickel alloys are etched much more readily than is the metal itself, particularly the nickel brasses.

In 1921 the production of steel of Czecho-Slovakia amounted to 917,662 tons, compared with 972,976 tons in 1920.

New Annealing Furnace and Carriage for Wire

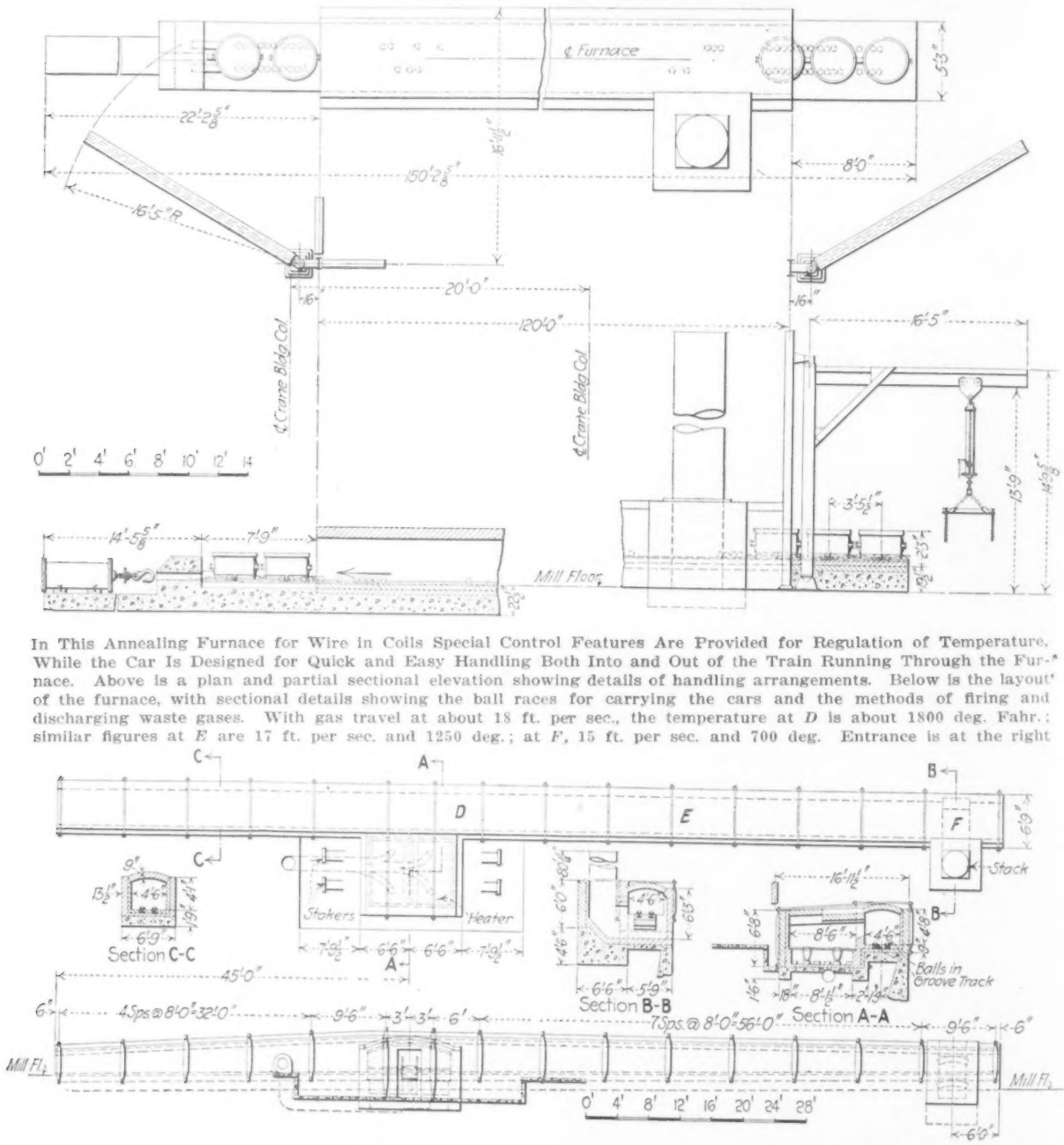
With the object of providing control of temperature at different parts of the furnace, causing a more efficient application of heat to all parts of the annealing pot and thus assuring a better quality of material annealed, a new furnace has been developed by Michael B. Kelly, president American Steel Co., Pittsburgh. Application has been made for patent on this furnace and also on the carriage carrying the pot into the furnace. The design provides for a gradual increase in temperature as the material is moved from the entrance end of the furnace to a central point and then a gradually decreasing temperature to the discharge outlet. This is accomplished by locating the heating element at the central point and adjusting the furnace roof and general cross section so that the temperature gradient is fairly uniform from that central point toward both ends.

Pyrometers located at intervals in the walls of the annealing chamber permit control of temperature, access to these pyrometers being arranged for by locating them in the manhole covers or doors. These manholes permit access to the interior of the annealing chamber in case one of the carriages becomes derailed or otherwise out of order.

To facilitate passage of the annealing pots through the furnace, the floor is slightly inclined from the entrance to the discharge end. In this floor is a pair of troughs or grooves extending the full length and fitted to carry balls on which the carriages are rolled.

Each carriage has a lug at each end and one on each side to preserve the position of the pot upon the carriage. The end lugs are arranged so that they may at the same time form coupling elements, coupling the cars together in a sort of train by means of a rod run through the lugs. The bed of the carriage has transverse ribs, thus permitting heat to get at the bottom of the pots located upon the carriage.

The first carriage of each train is connected by means of a hook to a hydraulic or other cylinder for pulling the train through the furnace. Passage through the furnace is continuous except as the train is stopped to permit cars to be lifted from the track after passing through the furnace. This delay at one end is taken advantage of at the other end to connect on another car. The car removed is lifted off the track by a crane and deposited upon the floor, whereupon the annealing pot is removed from the carriage and the empty carriage returned to the other end of the furnace for starting on a new journey. The balls upon which the carriages ride are confined to the grooves by the depth of the grooves and the fact that the bottom of each carriage forms an upper half of a groove, so that the balls cannot jump out. This serves to prevent uneven movement of the carriages.



In This Annealing Furnace for Wire in Coils Special Control Features Are Provided for Regulation of Temperature. While the Car Is Designed for Quick and Easy Handling Both Into and Out of the Train Running Through the Furnace. Above is a plan and partial sectional elevation showing details of handling arrangements. Below is the layout of the furnace, with sectional details showing the ball races for carrying the cars and the methods of firing and discharging waste gases. With gas travel at about 18 ft. per sec., the temperature at *D* is about 1800 deg. Fahr.; similar figures at *E* are 17 ft. per sec. and 1250 deg.; at *F*, 15 ft. per sec. and 700 deg. Entrance is at the right

Our Navy as a Great Industrial Asset

Development of American Steel Industry Credited to Naval Requirements—Non-Ferrous Progress Outlined—Mechanical Training of Personnel

BY J. K. ROBISON*

IT is not great armies or great navies or great guns that ail the world. These are but symptoms. The underlying causes of war lie in economic competition, the unequal distribution of raw materials, unequal distribution of population, helplessness of potentially rich countries and racial hatreds. Burglaries are not caused by the existence of burglars' tools; the tools exist because there are burglars. When the burglar reforms you will find his tools on the scrap heap, but no one ever reformed a burglar by taking away any or all of his tools.

The reasons why a navy exists, and its functions in peace and in war, have of late years become fairly well understood by our more intelligent citizens. But there is one phase of naval activity that is little known. I propose now to tell you something of how, in the words of the preamble of the Constitution, the navy is used as a means "to promote the general welfare."

I believe I can state without exaggeration that the navy has done more for commerce, science and labor than any other existing department of the Government. This appears to be an astounding statement in regard to a service whose duty is popularly believed to be confined to fighting battles. But let us examine the facts. The great stimulation of industry in the United States began in the early eighties and dates from the birth of the "New Navy," the original "White Squadron" which rose out of the ashes of the old Civil War navy, which last, through national lack of interest in events outside our own borders, had all but disappeared.

Steel of Domestic Manufacture

The act of Aug. 5, 1882, provided for two cruising steam vessels, to be constructed of *steel of domestic manufacture*. This requirement aroused the fierce opposition of the shipbuilders, because the steel industry of the United States could not furnish enough mild steel for the construction of two vessels of less than 5000 tons. Industry in the United States either used wrought iron or imported steel from England. In addition, the steel we made was inferior and did not come up to the specifications prescribed by the Navy Department. The American iron companies refused to erect the costly mills to handle the new material required, unless they were guaranteed a volume of business that would justify the original investment. These mills were not built until the contracts for the new navy were let.

The Navy Department "stood pat" on the specifications and insisted on the best grade of steel that could be produced. The mills were forced to experiment until they could make this steel. When they learned how, they found it was just as cheap to make good steel as poor steel. Steel suitable for ship plates dropped from 8½ to 4½c. per lb. As this was lower than wrought iron, it brought steel within the reach of every industry. Domestic consumption of steel increased a hundred fold, as steel was applied in many trades that hitherto had used other materials. The United States steel industry is now the greatest business in the world. The late Andrew Carnegie said that this industry was built up on the United States Navy, whose contracts, specifications and inspection work made steel what it is to-day.

In addition, the growing navy demanded all manner of cast, forged and machined steel. This demand called for better and larger machine tools and this industry began to grow apace. The insistence upon a domestic production, and the success of the country's machine designers and operators, caused a revolution in methods. America became independent of Europe for machinery and new items were added to our export trade. Machines large and accurate enough to handle turret mounts and big guns were equal to any task of private enterprise.

Starting as the parent of industry, the Navy Department became its pace maker. Each new set of specifications set the requirements a peg higher. In battle, nothing but the best is good enough. The manufacturer charged the navy more for the best until he learned how, and then quantity production brought the price down to the old level of the inferior product. Private industry could not do this.

Relation Between Defense and Profits

The reason the navy gives greater stimulation to industry than does private business is that the navy exists to defend the nation, while private business exists for profit. Private concerns must consider the cost of materials; the navy is concerned with the quality of materials. Victory cannot be measured by money. If a gun can be built of material that will give greater range, greater endurance and greater accuracy, we must have it, even if it costs ten times as much as another gun that is not so good. It has been truly said that, in battle, a second best navy is like a second best poker hand. Then again, on board ship weights must be kept down in order to get the most out of the tonnage. On shore cheap, heavy cast iron can be used where, on board ship, you will find forged steel.

In addition, since metals corrode more quickly at sea than on land, there is need for special bronzes and alloys. The navy has built up the industry in these classes and recently, by large orders, has put the important mon metal industry on its feet. The Navy Department organized and paid for the research that discovered the harmful effect of sulphur on steel, and improved the manner of working it to bring out its maximum strength. These discoveries were turned over to industry, with the result that the whole nation profited, with its safe and reliable automobiles, street cars, elevators, and so on. The armor plate industry has carried on more research into methods of treating and alloying steel than any other industry.

This field of metal development is still a new one. The inventor who can devise a plate for ships' bottoms that has the strength of steel and iron and the non-fouling properties of copper, can be assured of such aid and orders from the navy as will warrant cheap manufacture and will benefit the merchant marine of the whole world.

Development of a metal that will stand the erosion of gunpowder will revolutionize the internal combustion engine by making it capable of using superheated gases, and thereby develop powers far above the present limit. All commercial activity in this country depends so much upon the steel industry that it is known as the "Barometer of Trade." The navy practically founded this great industry, has guided its growth and will be the cause of future improvements now undreamed of.

Naval Stimulus to Machinery Design

Demands of the navy for high-speed ships, combined with low weights, necessitated the design of whole plants for our new vessels. The Bureau of Engineering was forced to design these plants, to invent

*Rear Admiral and engineer-in-chief, United States Navy, chief of Bureau of Engineering, Navy Department, Washington. This is an abstract of an address before the Michigan Bankers' Association, at Detroit, June 10.

parts that had never been developed and to conduct a laboratory for constant research and improvement. The urgent demand for increase of speed, reliability and safety, with vital necessity of economy in fuel consumption, has made the navy the pioneer in all new developments. The merchant service has followed step by step the increase in steam pressures, multiple expansion engines, turbines, internal combustion engines, electrical and geared reduction to propeller speeds, which were all developed by the navy.

In the electrical field the navy was again the pioneer. Starting with the incandescent lamp, every new electrical discovery has been fathered and adopted by the navy before its commercial use has been found practical or profitable. The Navy Department enabled the General Electric Co. to produce the first electrically propelled ship in the Jupiter, now the aeroplane carrier Langley. This development, one of the greatest in the art of ship propulsion, has been adopted for all future battleships.

The radiophone, which is now the talk of the country, is simply the coming into commercial use of a development that has been in general use in the navy for the last five years and was installed experimentally in 1907. The great radio telegraph plants that now encircle the globe are owned and operated by the navy. Without the navy's interest, experiments and research, as well as the substantial contracts to manufacture, the radio industry in this country would be wholly in foreign hands.

Trial and Error Methods

In our anxiety to have the best produced in every field of industry, every promising device is built and tried out, to determine its merit. If it is rejected, manufacturers are saved the loss of attempting commercial production; if it is a success, they benefit by it. Rigid specifications that require the highest possible results lead to constant improvement and development in manufacturing materials and methods. The results are at once reflected in improved commercial products.

A simple case in point was that of a large pump manufacturer, whose product was good, but capable of much improvement. The navy on a large order for pumps required a tensile strength for the naval brass of which they were made of 30,000 lb. per sq. in. The manufacturer claimed that this was impossible, and in his contention was supported by the rest of the trade. The bureau insisted and pointed out that by experimenting with different heats the solution of the problem would be found to be one of temperature. This proved to be the fact and tensile strengths of 50,000 lb. were easily achieved. This resulted at once in a lighter, cheaper and more reliable pump.

Sailors Turned Into Mechanics

So far I have alluded to the material side of industry only, but the personnel side is more important. Due to the fact that the great bulk of the enlisted personnel enter the navy at an age that precludes knowledge of a trade, it is necessary that they be taught one. For this purpose the navy has become one of the greatest trade schools in the world. On board ship there is scarcely a trade of any importance that is not represented. A battleship is a miniature city, with all the activities of an industrial city represented. Ships nowadays must be practically self-sustaining so that everything that goes into their manufacture must be capable of restoration or repair.

As the periods of enlistment are short, this great body of young mechanics is turned out into the industrial world in a steady flow—67,000 last year. What the navy loses industry gains. All may not qualify, but all have improved in knowledge, physical strength, discipline and self-reliance. A crew of 1200 boys that can keep a battleship going can keep any other plant going.

The navy turns out men skilled in all the present-day trades except farming, mining and masonry. The custom of shop mechanics having to operate a single machine has tended to reduce seriously the number of all-round mechanics. The mechanic on board ship, being chiefly engaged on repair work, gets a wide variety of experience and has less trouble in finding a job during periods of industrial depression than those with limited training in private plants.

Simplifying Cores for Water Cooled Journal Box

BY M. E. DUGGAN

Not uncommonly impossible cores come out of the drafting room. That a closer contact is essential between designing engineer and pattern maker is emphasized by the many failures that result from an incomplete understanding of the latter's problems.

Such a case is the water-cooled journal box here

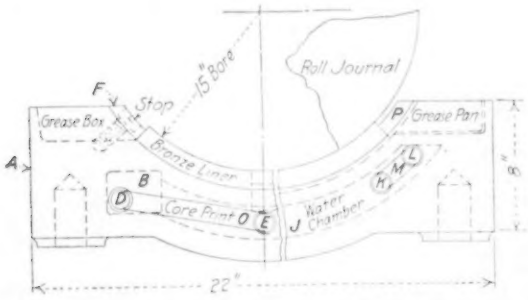


Figure Shows Original Design on Left and Simplified One on Right

illustrated, which, until simplified by the pattern maker, was an expensive experiment.

The original design is shown in Fig. 1. *A* is the casting, *B* is the cored water chamber with a square section as shown, and *D* a ⅞-in. cored hole leading into the water chamber from both sides. It was intended that these four ⅞-in. cores (two also in the other half of the casting) would support the body core and provide a means of getting the gas away. This they failed to do, and in addition it was practically impossible to clean out the core sand or to remove the core rods, which caused the molder to suggest that two more cored holes, as shown at *E*, be added to the casting, and that the core print *O* would assist in getting the gases away besides supporting the core in the mold. While this was true enough, these additional holes weakened the casting so that it broke in service.

The pattern maker then designed the core, as shown in the right. The water chamber *J* is a plain segment of a circle with a larger cooling surface close to the liner, the cored holes (*K* and *L*) are 1½ in. in diameter (instead of ⅞ in. as before) located near the ends of the cored chamber in the strong section of the casting, and the connecting prints *M* located near the ends and at both sides provide a means of getting the gas out and are a further support for the body core. The stop *F* is also simplified by making it an integral part of the casting, as at *P*, and a removable grease pan is substituted for the grease box.

Relative costs, security and service of the various types of insurance under workmen's compensation acts are covered by the report of an investigating commission sent out by the United States Bureau of Labor Statistics, and published as bulletin No. 301 of the bureau. The report consists of 194 pages, covering fully the findings of the commission in twenty states and two Canadian provinces, as follows: Ohio, New York, Illinois, Pennsylvania, Indiana, Massachusetts, Wisconsin, Michigan, Maryland, West Virginia, North Dakota, Colorado, Montana, Idaho, Wyoming, Nevada, Utah, California, Washington, Oregon, British Columbia and Ontario.

Competitive examinations for junior radio engineer in the United States Signal Service will be held on Aug. 9. Applicants should apply to the United States Civil Service Commission, Washington, for form No. 1312, or to any secretary of the United States Civil Service Board in the larger cities.

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The Broken Coal Year

Before the National Conference of Social Work at Providence last Monday, George Otis Smith, director of the Geological Survey, urged that the broken coal year must be mended, that the present coal strike, serious as it is, is but a symptom of the bad economic condition existing in the coal industry, which has a bad load factor, not merely in the broken year but in the broken month, week and day.

Director Smith quoted Mr. Peabody as a representative coal operator, who admitted that one-third of the coal mines represent a burden on the industry and who suggested their elimination through bankruptcy. He quoted Secretary Hoover's recent warning to the coal operators that "if the coal industry does not govern itself it will surely be governed by the public."

What Mr. Smith advocates is in substance such publicity for coal matters as will encourage consumers to buy regularly through the year and will eliminate profiteering. Then there would be steadier work for the economical mines, with moderate profits, an elimination of the less fit mines and a reduction in the number of coal miners.

It is a fact that publicity has sometimes achieved great results, and it is also a fact that in some things the public for years has refused to recognize the obvious. In the case of coal there exists already much machinery of publicity. There are the weekly reports of the Geological Survey, giving full statistics of production, with occasional references to stocks. These reports could be supplemented by reports of consumption, for which the present reports by the Survey on consumption by public utilities would form a nucleus. The Interstate Commerce Commission already gathers monthly reports of railroad consumption of coal. The "survey of current business" established by Secretary Hoover could cover coal price fluctuations very readily.

Director Smith said: "To hasten this needed deflation, even though it be accomplished through the working of the law of supply and demand, there must be a better informed and more aroused public opinion." It may well be suggested that Government machinery be set in motion to furnish the information upon which this public sentiment may be based.

There is a key question in this coal problem, or coal puzzle, and that is: "What causes a man to go into the coal business?" We have a situation in which there are altogether too many coal mines and yet the operators insist the profits have not been large. This is a matter that will bear looking into. If there is some psychological force that induces men to go into the coal business when they should not, the seriousness of the matter justifies consideration of the question whether Federal licensing of the opening of coal mines may not prove desirable. A quarter century ago the railroads considered it objectionable that the Government should regulate the amount of money they should collect from the public, while now they cannot so much as borrow money, or spend money in certain connections, without Government permission.

We know that there are too many coal miners. We may not know why there are too many coal mines, but we can guess why there are too many coal miners. The miners have been able to exact such high unit rates of payment as to afford them fair annual incomes plus much leisure time. The public, not the miner, has been paying for the leisure.

In recognition of the large place the aluminum foundry has gained in the industry, the American Foundrymen's Association devoted an entire session to it at the recent convention. The precedent will be followed at future conventions. The use of aluminum and aluminum alloy castings has grown by leaps and bounds in recent years, and this is true also of rolled and forged products. A well-known automobile engineer and designer pointed out recently that the public demand is turning to lighter weight per horsepower and that this can be secured only by the greater use of aluminum and its alloys. According to another authority, several large makers of automobiles have just decided to use duralumin connecting rods. In 1920 the world consumption of aluminum was 165,900 tons, of which the United States used 101,200 tons. In 1911 the totals were 46,800 tons and 20,900 tons. The world production in 1920 was 160,800 tons, and the United States was credited with 87,300 tons, or over 50 per cent. From many sources information is filtering in of new alloys or new products made with aluminum as the

base, of new properties developed by new applications of heat-treating methods, particularly electric. Apparently the industry has a period of even greater development ahead, both technical and commercial.

Stability Needed in Steel Prices

In the past 15 years there has been only one calendar year throughout which the steel industry has operated approximately at capacity. That year was 1916. The restricting causes have been various, including lack of orders, i.e., actual shipping orders, not "contracts," shortage of transportation, strikes in the steel industry, at coal mines and on the railroads, labor shortage and labor inefficiency.

In the nine years before 1916 the only active restrictive influence was shortage of orders. In the five years since 1916 shortage of orders was the dominant restrictive influence in two cases, while seven cases of the other kinds of restrictive influences can be counted. These seven cases were observed only in periods when there was a supply of orders sufficient for a heavier operation than was attained.

The steel productive capacity now in existence exceeds the average production in the five pre-war years, 1909 to 1913 inclusive, by approximately 100 per cent, and the average production in the three post-war years, 1919, 1920 and 1921, by about 68 per cent. What then? If we are seeking to know how the level of steel prices shall be determined in future, we may consider the factors that have operated in the past or look for some new factor or influence to be developed as a regulative force.

Before 1916 the only factor outside the control of the individual sellers that operated to sustain or advance prices was a sufficiency or excess of orders, and there was no calendar year between 1906 and 1916 in which at one time or another or throughout the entire year there was not a noticeable shortage of orders. Since 1916, on the other hand, the more prominent or more numerous factors restricting production and therefore making the market in favor of the seller, on the demand-and-supply basis, have been nothing less than economic misfortunes, since it is not good for commerce in general that there be inadequate transportation, that jobs seek men and cannot find them, that men should not work efficiently, or that the profits of an industry should be increased because men in that industry or in other industries go on strike. The steel industry does not wish to be catalogued in future as an opportunist industry, depending chiefly for its profits on something going wrong.

While 1906 and 1916 were years of full production, not one of the intermediate years was, and the dependence of the industry for profits in those nine years was upon the chance that the bulges would be strong enough to balance the poor times. It was a chance, but it worked out moderately well.

Apart from either taking this sort of chance or depending upon misfortunes, such as strikes, railroad congestion, labor shortage, etc., there is the opportunity for the steel producing industry and its customers to build up a practice that will represent a co-operative effort to restrict market fluctuations. The system should not depend upon main strength to prevent or restrict prices from declining or advancing, but to modulate the fluctuations so that a movement in one direction does not go so far as perforce to produce a sharp reaction in the other direction. There has not been this kind of effort in the past, but rather the opposite kind, buyers and sellers uniting at one time to push prices down and at other times uniting to push prices up. Had it not been for the influence of the United States Steel Corporation these forces would have produced still greater fluctuations than have occurred. Should consolidation in the steel industry go further, as now seems likely, one result might well be more stabilization of prices. The greater strength of the fewer independent organizations would impose responsibilities, in the matter of preventing violent fluctuations, which individual companies, under existing conditions, are not likely to assume.

British Gains in Tin Plate Exports

Welsh tin plate producers are rapidly recapturing the Canadian Pacific Coast market from American makers. In the first four months of this year shipments of American tin plate to Canada averaged less than 2000 tons per month; in 1913 they were over 4000 tons per month. In contrast, British shipments to Canada to May 1, this year, have been over 5000 tons per month; in 1913 they were only a little over 800 tons per month.

A prominent Welsh tin plate producer is quoted as saying that "British manufacturers have lowered costs in all directions to a strongly competitive basis. With some exceptions the Welsh tin plate industry has been able to retain most of its old customers and to recover the Canadian market which we lost to the Americans previous to the war."

While it is true that British tin plate exporters have made greater percentage gains this year than their American competitors, they have not yet equalled their pre-war rate. For the four months ending with April British tin plate exports totaled 143,979 gross tons, against 163,095 tons for the corresponding four months in 1913. American exports to May 1, this year, have been 30,741 tons. They were 25,744 tons for the same four months in 1913, so that the increase has been about 20 per cent. Thus the prospects are bright that 1922 will be not only a record year in production and domestic consumption of American tin plate but also will register a new high mark in exports.

Among the factors making for efficiency, good eyesight is one which has had too little expert attention. In a recent examination of more than 10,000 employees in factories and commercial houses, the Eyesight Conservation Council of America found that 66 per cent had defective

vision; 13 per cent of the employees were wearing needed glasses, while 53 per cent had the need but not the glasses. In one large factory 20 per cent of the inspectors were found unable to see sufficiently well to detect defects in the product they were inspecting. From the standpoint of the individual, health, quality of output, quantity of production—all will be best served when eye strain is relieved. And the result to industry will be greater production at lower cost.

CORRESPONDENCE

The Syndolag Patent Decision

To the Editor: There appeared in THE IRON AGE, June 15, in an article "Syndolag Patents Sustained" an account of a suit brought by the Allen S. Davison Co., Pittsburgh, against J. E. Baker Co., York, Pa., which was not a correct statement of facts.

The suit of Allen S. Davison Co. against the J. E. Baker Co. upon certain Barr and Meyer patents which the Davison company alleged to cover its product syndolag and to be infringed by the Baker company in making its product magdolite, came on for trial at Williamsport, Pa., on June 5. At the close of plaintiff's opening case on June 8, the Baker company's counsel in outlining the defense pointed out that magdolite had been made for over a year precisely as it had been made by the J. E. Baker Co. prior to Barr's and Meyer's time, and that on cross-examination the Davison company's witnesses had admitted that they had observed no difference between magdolite so made and the magdolite made in the way that was claimed to infringe and that the Baker company proposed to prove by the testimony of numerous users that there was no difference. Thereupon the Davison company offered to waive all claims for profits or damages and to proceed no further with the trial. The litigation was then settled by the entry of a consent decree stating that the patents were valid and that the Baker company should not infringe them. The Baker company did not admit that it had ever used the Davison company's patents and the decree specifically stated that no finding was made as to any infringement by the Baker company. The decree further provided that the Davison company should not recover any profits or damages or costs.

The position of the Baker company is and always has been that it has never used the Davison company's patents and has never wanted to use them. The result of this litigation has not been to interfere in any way with the Baker company's manufacture of magdolite, which always has been made and is continuing to be made under certain patents granted to J. E. Baker many years before the Davison company entered the field.

J. E. BAKER,
J. E. Baker Co.

York, Pa., June 23.

EDITOR'S NOTE

The decree in the case referred to above was as follows:

This cause having come on to be heard and plaintiff's *prima facie* proofs having been taken, and it being represented to the court that the defendant has changed its practice since the filing of the bill of complaint and more than one year ago by discontinuing the addition of slag, scale or equivalent materials in the passage of its product through its rotary kilns in making magdolite, and that the plaintiff waives all claims for profits and damages, and that the plaintiff has recognized the validity of the patent to J. E. Baker, No. 1,063,103, dated May 27, 1913; now, it is

Ordered, adjudged and decreed that the plaintiff is the owner of patent No. 1,206,771, issued to Allen S. Davison Co. on Nov. 28, 1916, as the assignee of Charles J. Barr, and of patent No. 1,300,631, issued to Allen S. Davison Co. on April 15, 1919, as the assignee of Albert P. Meyer, and that the same are good and valid in law; and, the defendant having offered no testimony, the court makes no finding as to infringement of said patents.

And it is further ordered, adjudged and decreed that an injunction issue out of and under the seal of this court enjoining and restraining the defendant J. E. Baker Co., its associates, attorneys, solicitors, clerks, servants, agents and workmen, from future infringement of said letters patent Nos. 1,206,771 and 1,300,631 or either of them.

It is further ordered, adjudged and decreed that plaintiff recover no profits or damages in this action and that no costs be taxed against the defendant.

French Investments in Russia

To the Editor: The attitude taken by France and Belgium at the Genoa conference regarding property of their citizens confiscated by the Bolsheviki in Russia was an uncompromising demand to return such property. After the conference was closed, there was a communication from Paris that in case France's demand would be satisfied, her participation in the rehabilitation of Russia would begin experimentally, so to say, in one region, with the idea of working from it gradually to the outside districts. It was also stated that the first experimental district would be the so-called Donetz Basin in South Russia.

There is a distinct connection between the stand taken by France at Genoa and the later advice about her desire to work in the Donetz Basin. A few figures will illustrate the whole situation in a nutshell.

First of all, one has to know that the mining and metallurgical enterprises of the Donetz Basin and the adjoining Krivoy Rog and the manganese ore deposits in the Nicopol-Mariupol region (all in South Russia) constitute not only the main elements of industry in South Russia but also the main source of iron and coal for the whole of Russia. In the 50 years prior to the revolution, the coal, iron and manganese industries in this part of Russia had been developed enormously. In this development both Russian and foreign capital, principally French, played the greatest part. The total amount of capital invested in mining and metallurgical enterprises in South Russia is about $750,000,000, distributed about as follows: Metallurgical enterprises, $350,000,000; coal and anthracite mines, $350,000,000; iron and manganese mines, $50,000,000.

The following table shows the importance of the coal industry in the Donetz Basin for the whole of Russia:

Coal Production in Russia

Year	Output in Million Tons in Donetz Basin	Output in Other Regions in Per Cent of the Donetz Basin		
		Dombrov	Ural	Caucasus, Siberia and Turkestan
1911	20	30	3.5	10
1912	21.4	30	5	11.5
1913	24.7	28	5	10

The Dombrov Basin (in Russian Poland) does not belong to Russia now, and, as the table shows, the output of all other sources of coal in Russia does not constitute more than 15 per cent of the output of the Donetz Basin. In 1916 the output of the Donetz Basin was about 28 million tons, i.e., it increased despite war conditions. This output, classified according to the capital behind the production was as follows: French, 26 per cent; Belgian, 14 per cent; English, 6 per cent; Russian (banks and private), 54 per cent. In other words, the industry worked to the extent of about more than one-half on Russian capital, and 40 per cent on French and Belgian.

As to the iron ore deposits in the Krivoy Rog, about 7 million tons was produced yearly in the years preceding the war, and about 4.2 per cent of this quantity of manganese ore was produced in the Nicopol-Mariupol district. The manganese mines belonged entirely to Russian banks; as to the iron ore mines, their subdivision as to origin of capital was as follows: French, 44.35 per cent; Belgian, 36.9 per cent; English, 2.7 per cent; German, 1.. per cent; Russian (banks and private), 14.35 per cent.

These figures show distinctly that in the most developed and richest industrial region of Russia, it was the French, Belgian and Russian capital that owned its enterprises that, compared with the French, Belgian and Russian participators, the participation of

Italy was nil and of England insignificant, and that, therefore, any concessions which Great Britain and Italy may receive in South Russia will be practically at the expense of the Russian, French and Belgian owners, and this the more so because a considerable portion of the capital in the Russian banks was also of French origin. R. POLIAKOFF.

New York, June 20.

Office of Roll Grooves in Consolidating Metal

To the Editor: The more or less prevalent idea that two bars of the "same general shape," but characteristically different, can be developed by using the same general progressive types of roll grooves should be abandoned, for the reason that in almost all cases such pretend to be nothing more than a means to produce a shape regardless of the inimical or beneficial effects on the bar rolled.

For example, compare common merchant round and high grade staybolt round, both possessing the same general shape. A rolling mill equipped with general-purpose roll grooves for common round, and accepting orders for staybolt round, usually proceeds to roll the latter with the common-purpose grooves. This practice, of course, is wrong and for the principal reason that the structure of the staybolt round is quite different and demands types of grooves altogether different from those for common merchant purposes.

Proper types of grooves for rolling staybolt and the like should provide for continuous uniform consolidation of the metal from the surface toward the center of the mass, causing the least possible structural disturbance or internal tension, so that the progressive shaping, associate temperatures and final cooling is obtained with minimum distortion. Almost any metal receiving these advantages while conforming, and staybolt iron in particular, will be bettered structurally regardless of the chemical property. In other words, the effects of the roll grooves while shaping and consolidating the metal is a very essential factor and does alter the character of the finished product.

A. W. HEINLE.

Crafton, Pittsburgh, June 24.

FABRICATED STEEL BUSINESS

Bridge and Building Awards and Tonnages Pending at Leading Centers

Awards for fabricated steel work for the past week were as follows:

Telephone exchange, Coney Island, Brooklyn, N. Y., 800 tons, to Hedden Iron Construction Co.

Parochial school, Bronx, New York, 500 tons, to George A. Just Co.

Manhattan College, New York, 400 tons, to Michaelman & Gordon Iron Works.

Plant in New Jersey for Henry L. Doherty, 700 tons, to an unnamed fabricator.

Magma Copper Co., buildings for smelter, Superior, Ariz., 2300 tons, to Kansas City Structural Steel Co.

Montreal Mining Co., hoisting engine house for No. 5 shaft, Montreal Mine, Hurley, Wis., 132 tons, to Worden-Allen Co.

Iowa Highway Commission, three 80-ft. plate girder spans, 116 tons, to American Bridge Co.

Northern Pacific Railway, overhead bridges between Minneapolis and St. Paul, 270 tons, to American Bridge Co.

Green Bay, Wis., Strauss trunnion bascule span, 1000 tons, to Wisconsin Bridge & Iron Co.

Manufacturing plant, Claybourn Process Corporation, Milwaukee, 213 tons, to Lakeside Bridge & Steel Co., North Milwaukee.

National Brick Co. at Deerfield, Ill., 500 tons, to Wisconsin Bridge & Iron Co.

Addition to Ford body factory at Iron Mountain, Mich., 350 tons, to Worden-Allen Co., Milwaukee.

Detroit, Mich., new Twelfth Street bridge, 260 tons, to Wisconsin Bridge & Iron Co.

Coal trestle for Michigan Smelting Co. at Houghton, Mich., 125 tons, to Worden-Allen Co.

Addition to producer house and monorail for Wisconsin Gas & Electric Co. at Racine, Wis., 175 tons, to Worden-Allen Co.

Hoist house for Montreal Mining Co., Hurley, Wis., 150 tons, to Worden-Allen Co.

Jackson Building, Delaware Avenue and Chippewa Street, Buffalo, to Jones & Laughlin, 1450 tons.

High school, Batavia, N. Y., 600 tons, to Kellogg Structural Steel Co.

N. & G. Taylor Co., Philadelphia, extension, 140 ft., to present tin house and foundry building, 50 x 90 ft., at Cumberland, Md., works, to Belmont Iron Works.

Bridge construction work, Board of Public Grounds and Buildings at Deer Creek, Clearfield County, Pa., Independent Bridge Co., Pittsburgh, low bidder by $4 on the $34,840 involved.

Department store, Rollman & Sons Co., Cincinnati, 700 tons steel and 500 tons reinforcing bars, general contract to Thompson, Starrett Co.

Dam No. 32, Ohio River, 600 tons, and dam No. 34, National Contract Co., Evansville, Ind., low bidder.

Gas holder, East Chicago, 500 tons, to Stacey Mfg. Co., Cincinnati.

Gas holder, Coffeyville, Kan., 250 tons, to Stacey Mfg. Co., Cincinnati.

Office building, Boston, 2000 tons, to New England Structural Co.

Office building, Boston, 1000 tons, to Lehigh Structural Steel Co.

Boston-Cambridge bridge, 700 tons, to Boston Bridge Works, Inc.

School building, Boston, 400 tons; school building, Fitchburg, Mass., 170 tons; school building, Waltham, Mass., 140 tons; store, Boston, 107 tons, all to Boston Structural Steel Co., Inc.

Big Four Railroad, bridge, Terre Haute, Ind., 1500 tons, to Mount Vernon Bridge Co. and King Bridge Co.

Seneca Wire & Mfg. Co., Fostoria, Ohio, plant extension, 450 tons, to American Bridge Co.

Sullivan Machinery Co., Michigan City, Ind., 1500 tons, to Kenwood Bridge Co.

Consistory Building, Denver, Col., 1600 tons, to American Bridge Co.

Structural Projects Pending

Inquiries for fabricated steel work which may be added to lists of pending projects include the following:

Hospital at Philadelphia, 400 tons.

Public schools Nos. 19 and 69, New York, 700 tons.

National bank, Ft. Wayne, Ind., 1500 tons.

Yale University, New Haven, 325 tons.

Armory, 142nd Street, New York, 1000 tons.

Highway bridge, Boston, 300 tons.

Highway bridge, Philadelphia, 275 tons.

Michigan Central Railroad, bridge over Niagara River, as noted in THE IRON AGE of May 25, 7500 tons, bids taken June 30.

Cincinnati Northern Railroad, 250 tons bridge work, bids close July 3.

Dam No. 34, Ohio River, 500 tons, bids close July 17.

Dams No. 36 and 38, Ohio River, 650 tons, bids close June 30.

Addition to Girard Trust Co., Philadelphia, 1000 tons.

Underpinning for aircraft warehouse at League Island Navy Yard, Philadelphia, 350 tons; general contract let to Triest Construction Co.

Locomotive shop for the Missouri, Kansas & Texas Railroad, Waco, Tex., 1400 tons.

Gilsy Hotel addition, Cleveland, 200 tons, bids received.

Medical building, hospital unit and power house for Western Reserve University, Cleveland, bids to be received July 13.

Nebraska State Capital, 1950 tons, all bids rejected.

Illinois Central Railroad, grade crossing, Madison, Ill., 260 tons.

Bradner Smith & Co. warehouse, Chicago, 300 tons.

Reinforcing Bar Business in Chicago

Reinforcing bar distributors are as heavily booked as in 1920, although it is notable that jobs this year have been individually smaller on the average and have been largely non-industrial. Recent awards include: Headhouse, Chicago Union Station, 400 tons to Paul J. Kalman Co. New work includes: Western Packing Co., packing house, Chicago, 225 tons; Morton Hotel, Grand Rapids, Mich, 175 tons; bridge, Ottawa, Ill., 100 tons, Koss Construction Co., Des Moines, Iowa, general contractor; paper mill, Kalamazoo, Mich., Vegetable Parchment Co., 600 tons, Henry L. Vanderhorst, Kalamazoo, Mich., general contractor; Garrett Biblical Institute, Evanston, Ill., new building.

MACHINE-TOOL MERGER

Five Companies Join as the Consolidated Machine Tool Corporation; Capital $30,000,000

A merger of five leading machine-tool manufacturing companies, which has been under negotiation for more than a year, has finally been consummated under the name of the Consolidated Machine Tool Corporation of America. Articles of incorporation have been filed in Delaware with capitalization at $30,000,000. The capital stock is made up of 200,000 shares of no par value and $10,000,000 in 7 per cent non-cumulative preferred stock. The companies entering the merger are the Betts Machine Co., Rochester, N. Y.; Colburn Machine Tool Co., Cleveland; Hilles & Jones Co., Wilmington, Del.; Modern Tool Co., Erie, Pa., and the Newton Machine Works, Philadelphia.

Further details of the organization, including the election of officers and directors, will be worked out at a stockholders' meeting to be held on Friday, June 30. W. H. Marshall, former president of the American Locomotive Co., New York, will become chairman of the board, and C. K. Lassiter, who recently resigned as vice-president of the American Locomotive Co., will be president. Headquarters of the company will be at 17 East Forty-second Street, New York.

Definite plans for the sales organization of the consolidated company have not been announced. Though manufacturing a fairly broad line of machine tools, the new company will be especially strong in railroad shop equipment. Details regarding the companies which have entered the merger follow:

Betts Machine Co.

The Betts Machine Co., established in 1858, early in 1918 was sold to the Bridgeford Machine Tool Co., Rochester, N. Y., which retained the name Betts Machine Co. The company's line now consists of heavy duty tools, including planers with beds 36 to 144 in. in length; engine lathes with beds up to 100 in.; boring mills with 5 to 18 ft. extensions, axle lathes, coach-wheel lathes, driving-wheel lathes, horizontal boring and milling machines, slotters, etc.

Colburn Machine Co.

The Colburn Machine Tool Co., which was organized in 1901, formerly had a plant at Franklin, Pa., but a year or so ago completed a new plant at Cleveland. In April, 1921, the company placed on the market $600,000 worth of bonds and at that time disclosed in its reports a "sound value of property" amounting to $1,526,330.94. The average net earnings over a five-year period were given as $194,000 a year. E. P. Breckenridge, Toledo, Ohio, is president; H. W. Breckenridge, vice-president and general manager and W. E. Barrow, secretary and treasurer. These officers with W. B. Stewart and L. W. Burlingame constitute the board of directors. The company makes boring mills with extensions up to 5 ft., heavy-duty drill presses, etc.

The Newton Machine Tool Works, Inc., Philadelphia, is a manufacturer of milling machines, of which its slab miller is especially well known; slotting machines, cold-metal sawing machines, crank planing machines and rotary planing machines. The company has been in existence since 1907. Harry W. Champion is president.

The Modern Tool Co., Erie, Pa., is a manufacturer of plain and cylindrical grinding machines and piston grinders; also open dies, quick-changing collapsible taps, solid adjustable dies, special staybolt dies, adjustable hollow mills and adjustable chucks. Its officers are F. H. Payne, president; Arthur Seep, vice-president; John J. Harvey, treasurer and C. E. McArthur, secretary.

Hilles & Jones Co.

The Hilles & Jones Co., Wilmington, Del., which manufactures punching and shearing machinery of various types and sizes, plate bending rolls, plate straightening rolls, plate edge planers and various special machines for use in steel car plants, shipyards and structural works, was founded in 1854. After about 20 years' existence as a general manufacturing and jobbing machine shop under various managements and ownerships, the partnership of Hilles & Jones was formed by William S. Hilles and Henry C. Jones, and since that time the business has grown from a very small beginning into a large and thoroughly equipped plant. The present facilities include machine shops and a foundry 210 x 250 ft. The whole plant occupies nine acres. The capacity of the foundry is approximately 1000 tons a month and single castings weighing up to 150,000 lb. can be made. Officers of the Hilles & Jones Co. are: Henry J. Bailey, president; Robert W. Smith, vice-president; George C. Bailey, secretary; L. T. Jefferis, treasurer; Harry W. Mason, assistant treasurer. Wilbur C. Jones and Charles E. Thomas are in charge of the sales department; James S. Stirling is manager of the foundry department; James H. Scott is superintendent of plant, and J. Thomas Warren is purchasing agent.

Careers of Mr. Marshall and Mr. Lassiter

W. H. Marshall, mentioned for chairman of the board of directors, has spent the better part of his lifetime in mechanical work. He began in the drafting room of the old Rhode Island Locomotive Works; later engaged in editorial work on the *Railway Review* in Chicago and on the *American Engineer* in New York, but in 1897 he went back to mechanical work as assistant superintendent of motive power of the Chicago & Northwestern Railroad. He went to the Lake Shore in 1899 and was advanced from superintendent of motive power to general superintendent and then to general manager in 1903. In 1906 he became president of the American Locomotive Co. and retained this position until 1917 when he became identified with well known banking interests. During the war, he served as chief of the production division of the Ordnance Department. His more recent connections have been with the T. A. Gillespie Co. and the Gillespie Mfg. Co., being chairman of the board of the latter.

C. K. Lassiter has been for many years prominent in the machine-tool trade, but as a buyer. As vice-president in charge of manufacturing of the American Locomotive Co., he supervised for many years the purchases of mechanical equipment by that company. Moreover, he designed many machine tools for the company's own use. He resigned from the American Locomotive Co. a few months ago to devote his time to the completion of the machine-tool consolidation.

A Winchester-Simmons Hardware Merger

A merger of the Winchester Co., New Haven, Conn., and the Associated Simmons Hardware Companies, St. Louis, was announced this week by the two organizations, representing the largest consolidation ever effected for manufacturing and jobbing in hardware and small arms. It is stated that the consolidation will be operated through a holding company, to be known as the Winchester-Simmons Co., and both interests will be represented on the board of directors. J. E. Otterson, president Winchester Co., said:

"The Winchester Co. will operate as the manufacturing organization and the Associated Simmons Hardware Companies as the distributing organization. The Simmons companies will continue the operation of their hardware jobbing business as hitherto and in addition will act as distributers of the Winchester products to the Winchester stockholders' agents, and for this purpose the sales, warehousing and distributing organizations of the Winchester and Simmons companies will be combined and henceforth operated as one. By this plan it is hoped to eliminated duplication of effort and to effect economies that have not been possible under separate operation."

The Simmons company has been for years the largest hardware jobbing corporation in the country. It has warehouses in St. Louis, Wichita, Sioux City, Minneapolis, Toledo, Los Angeles, Boston and Philadelphia. It has a cutlery plant at Walden, N. Y., also manufactures at St. Louis and Philadelphia, and markets a number of products manufactured for it under contract. In addition to its great plant at New Haven, the Winchester company operates the Barney & Berry plant at Springfield, Mass., and that of the Mack Axe Co., Beaver Falls, Pa. The Winchester Co. has capital stock of $21,754,700, and its subsidiary, the Winchester Repeating Arms Co., an issue of $7,000,000 7½ per cent gold bonds. The Associated Simmons Hardware Companies owns the entire capital stock of the Simmons Hardware Co. and the Simmons Warehouse Co. It has outstanding, $9,300,000 common stock, and $5,110,000 preferred stock. An issue of $7,500,000 five-year 7 per cent gold notes was made on May 1, 1920.

Seeing the End of the Coal Strike

More Favorable Signs in the Connellsville District—A Union Leader Concedes Strike Is Lost—Gains in Output

PITTSBURGH, June 27.—Belief that the end of the coal strike is not far off is stronger here now than it has been at any time since the trouble began. This sentiment finds its origin in part in the activities of the Administration in trying to bring about a settlement of the dispute; but signs are not lacking of a more conciliatory attitude on both sides. It is no secret that union leaders from the beginning have realized the futility of trying to retain war-time scales and working conditions and unless there is an outbreak among railroad employees as a result of the wage reduction effective July 1 it is believed here that it will not be difficult to get the miners' leaders to make concessions. There is also the impression that the operators, while insisting on agreements by States and the elimination of the check-off system, might yield in the matter of the wage rate they would pay to get their mines going.

Production of both coal and coke in the non-union districts of western Pennsylvania is making a steady gain. Coal loadings on the railroads serving this territory in the past week have averaged very close to 2500 cars daily, which is almost 31 per cent of normal and reflects an even higher rate when it is figured that union mines are doing little or nothing. Available supplies of coal from nearby fields are extremely limited and the market is quotable from $3.75 to $4 per net ton at mines. Southern coal is quoted at $3.25 to $3.50.

Coal Production Increases—Union Leader Gives Up Fight

UNIONTOWN, PA., June 24.—Production in the Connellsville bituminous region during the past week showed an increase of 8,150 tons, an increase of 18,150 tons, approximately, for the past fortnight. All indications are that the region has settled down to a steady increase in output which will bring the production around July 1 to a much more nearly normal basis than had been expected.

William Herron, former president of the U. M. W. A. local at Edenborn, announced publicly his resignation as president of the union and stated that the union had failed to win the strike in this region. He urged all workers to return to their places. Herron declared that he was ready to meet the union organizers at any time in public debate upon the issues and to defend his attitude that the strike had been lost and that the men should return to their places in the mines. Herron declared that he was largely responsible for the organization of the Connellsville region, that he began work quietly last September. His statement created a sensation.

There have been several instances of dynamitings during the week, but no serious disorders have occurred. A large mass meeting of striking miners was held at Point Marion, but the meeting was without incident.

Numbers of workers coming into the region are increasing. Some of these are being brought in by the various companies. Others are coming from union fields and are beginning work.

Noticeable gains in production are being made by The H. C. Frick Coke Co. Leisenring No. 1, which surprised all observers by joining in the walkout, has resumed operations on a large scale. One hundred ovens are in operation at this plant. Leisenring No. 2 and No. 3 are working at approximately 100 per cent. The Frick company has increased its production this week by 700 tons a day. Independent operations fired 225 ovens during the week.

It is reported semi-officially that 100 ovens were fired at the Alicia plant of the Pittsburgh Steel Co. Alicia, at Brownsville, is in the very heart of the most strongly unionized section of the region and in the section which was tied up the first week of the strike.

Administration's Attempts to Bring About Settlement—Definiteness Lacking

WASHINGTON, June 27.—While present plans of the Administration for the settlement of the coal strike are based on attemped persuasion and voluntary agreement, the coal operators and miners appear to be as far apart as ever. Owing to this the impression prevails here that the Government will be compelled to pursue a pointed and drastic course, unless terms of agreement are reached soon. Authority for the statement that the Administration will resort to such a policy, if public safety requires it, came from a high official source this afternoon. It was stated that the Government, whose plans for the strike settlement will not be given out for the present, cannot intervene pointedly unless the safety of the consuming public is threatened and consequently it is attempting to bring about a conclusion of the strike by voluntary agreement. This plan failing, then a drastic course will be adopted, it was declared.

The present situation indicates that the latter may have to be resorted to. President John L. Lewis of the United Mine Workers, who has been in conference with President Harding and Secretary of Labor Davis, has issued a statement following his interviews which is taken by some to be not only a defy to the operators but to verge on a defy to the Government itself. By some, however, this is taken to be a political pose so common to organized labor officials, and they believe it will be quickly dropped if pressure from the Government is found necessary. The Lewis statement that the miners will not enter into any conference looking to settlement of the strike through district agreements is said to indicate that the Administration had called him to Washington for the purpose of bringing about negotiations through that plan. At the same time, operators are strongly opposed to national agreements, so that one of the fundamental differences between the operators and miners is as strongly marked as ever. But in case the administration should employ pressure, it is believed that neither side would hardly face opposition of the Government and public sentiment and refuse to confer on any basis the Government might select.

No Conference Without Government Representation

The Government, it was announced officially, will not under existing circumstances sponsor any conference in which it is not represented. Indictments now held against coal operators and miners for alleged conspiracy through conferences prompted the statement of the Government attitude coupled with its announced intention of giving immunity to both sides if a conference is called by it, as is believed probable. Such immunity, it was stated, would be assured through Government representation at the conference.

It is evident that the Administration, contrary to its attitude when the strike began, views the situation with considerable concern. It also is apparent it proposes to go further than merely to patch up the present strike. Plans are said to call for a settlement which will be more or less permanent, so as to put an end to

the recurring strikes to which the country has been subjected, but it is believed that the Administration wants to avoid Government control or regulation, though tendency favoring the latter is growing in Congress.

A commission such as the Railroad Labor Board, it has been stated, has been suggested as a possible creation to settle labor troubles in the coal industry, following its readjustment on a more stable basis, by assuring more constant employment, fewer miners and elimination of the intermittent and high cost mines. It is said that organized labor might object to such a program as this, but that it would be shown that it is based on a sound study and that the objection would be overcome through public approval.

The shocking tragedy in the Herrin, Ill., district, in which nonunion miners were shot down, has greatly damaged the organized miners' case, and a high Government official, in speaking of it to-day, said that murder is murder whenever committed, no matter by whom, and cannot be extenuated.

Action by Chamber of Commerce

Meanwhile, the Chamber of Commerce of the United States has projected itself into the coal strike situation. President Julius H. Barnes to-day called upon 1400 business organization within the organization to lend their co-operation in helping to prevent a runaway coal market by appointing a fuel committee to make a survey of the local coal situation. He has addressed a letter to local chambers, in the course of which he says:

"In view of a possibility of the strike continuing until depletion of stocks becomes serious, I believe that in the general public interest this situation should be anticipated as much as possible. In the absence of other machinery, and in view of a possible emergency, I suggest that you appoint a fuel committee to survey the conditions relative to stocks on hand and needs in your community or industry. And further that this information be compiled so that in event the situation does become serious, it can be used in any plan involving a distribution of available coal."

Mr. Barnes's appeal is directed to those not included in the Hoover plan for pooling purchases by larger buyers, including the railroads and public utilities. The Barnes statement indicates that the metallurgical industry is participating in this plan, but it has been announced that it is not.

Non-Union Fields Increase Output

WASHINGTON, June 27.—Taking a sharp upward turn in the twelfth week (June 19-24) of the strike, indications are that production of soft coal will be well above the 5,000,000-ton mark and may approach 5,500,000 tons, according to the Geological Survey. Complete returns of the eleventh week show a production of 4,986,000 tons of soft coal and 22,000 tons of anthracite. One year ago, the total output of all coal was 9,490,000 tons, while in the year of active business, 1920, it was 11,950,000 tons. The record of the twelfth week shows a prompt recovery from the traffic congestion which had interfered with the placement of cars at mines in eastern Kentucky and parts of West Virginia. Loadings on Wednesday, June 21, amounted to 17,010 50-ton cars, which was a record for the week, as was also the loading of 16,561 cars on the preceding day.

The increased production does not come from any of the strongly organized fields, but results from an actual return to work in non-union fields affected by the strike and from increased activity in districts of the Far West where demand has hitherto been insufficient to call out full production. The accumulation of unbilled loads is still declining and the draft upon consumers' stock piles continues. In the eleventh week of the strike, the daily average number of unconsigned loads of bituminous coal was 4672 and on June 20 returns from a group of 22 of the largest carriers that hold about 75 per cent of the total number of unbilled loads showed the total to be only 3044. It is now less than a sixth of the unbilled cars in the week of April 8 and the quantity is estimated at only 250,000 tons. In comparison with the country's daily requirements of over 1,000,000 tons, this situation is causing considerable concern.

The lake movement increased during the week ended June 18, but was still far short of that in the corresponding period a year ago. A total of 377,952 tons of cargo coal was dumped over the piers at Toledo and Sandusky, as against 1,085,031 tons in 1921. Of the total, 70,975 tons were consigned to Lake Erie destinations not ordinarily taking lake coal, the quantity shipped to regular lake destinations being only 306,977 tons.

The cumulative dumpings of cargo coal for the season to date now amount to 2,943,128 tons, but of this, 738,121 tons went to Buffalo and other unusual destinations. The quantity shipped up the lakes to customary destinations has been only 2,205,007 tons. This is 550,000 tons short of 1920, and about 5,500,000 tons short of 1919 and 1921.

Railroad Equipment Business

Quite a large number of railroad car or locomotive orders came to light in the past week. The Interborough subway system in New York bought 100 cars of the Pullman Co. and the Buffalo & Susquehanna placed 200 hopper car bodies with the Standard Steel Car Co. The American Locomotive Co. reported sales of 15 locomotives.

The Northern Pacific has placed 1000 automobile cars and 300 stock cars with the General American Car Co.

The Nashville, Chattanooga & St. Louis has ordered 5 Mikado locomotives from the Baldwin Locomotive Works and is inquiring for 750 freight cars, including 350 box and 150 stock cars.

The Baltimore & Ohio has ordered 1000 box car bodies from the Standard Steel Car Co. The Tennessee Central has placed 350 gondola cars with the Western Steel Car & Foundry Co.

The Philadelphia & Reading is inquiring for 100 refrigerator cars and 10 passenger cars and the Missouri, Kansas & Texas for 25 dump cars.

The orders received by the American Locomotive Co. were as follows: Magma Arizona Railroad, 1 consolidation type weighing 199,000 lb.; Tennessee Copper Co., 1 six-wheel switching type weighing 133,000 lb.; W. F. Carey Co., 2 four-wheel switching type weighing 79,000 lb.; Abitibi Power & Paper Co., Ltd., 1 mogul type weighing 141,000 lb.; Chosen Railway (Korea), 6 Pacific type weighing 203,000 lb.; Boyne City Lumber Co., 1 suburban type weighing 66,000 lb.; Lehigh Portland Cement Co., 1 four-wheel switching type weighing 43,000 lb.; Standard Slag Co., 2 four-wheel switching type weighing 99,000 lb.

The St. Louis Southwestern is inquiring for 100 automobile cars.

The Pennsylvania system is negotiating for 16,000 freight cars, with the possibility that 30,000 may be bought.

The New York, Chicago & St. Louis is inquiring for 4 Pacific and 6 Mikado type engines.

The Alabama & Vicksburg has placed 1 locomotive with the Baldwin company.

The Lehigh & New England is inquiring for 5 Mikado engines and 50 gondola cars.

The Illinois Central has placed repairs on 300 general service cars with the Illinois Car Co., this being in addition to the repair awards published in THE IRON AGE of June 15.

Railroad Scrap Classification Adopted

At the meeting of railroad purchasing agents at Atlantic City, last week, the scrap classification published under Circular 2193, American Railway Association, Division No. 61, purchases and stores, Oct. 1, 1921, was adopted without change. The proposed adoption of the net ton as the unit of weight for the sale of all grades of scrap did not go through and was left to the discretion of the individual lines to sell on any basis they see fit.

DEATH OF THOMAS DEVLIN

Passing Away in Philadelphia of Pioneer Malleable Foundryman

THOMAS DEVLIN, one of the pioneer foundrymen of the United States and for many years president of the Philadelphia Foundrymen's Association, died Friday evening, June 23, at his home in that city, following a long illness. The funeral was held Tuesday morning at St. Malachy's Church, Philadelphia. He was in his 84th year. Mr. Devlin was president of three companies, the Thomas Devlin Mfg. Co., the Hardware & Malleable Iron Works and the National Specialty Co. He was born in Ireland, received a common school education in that country, supplemented by night school studies in the United States, to which he came at the age of 16. His business career started with him in the role of office boy at $1.50 a week when he was engaged by Thomas R. Wood & Co. He had an agreement that he was to obtain an advance of 50c. every six months. He continued until early in 1857, when there was a money panic, the shop was closed and he went to school for four months. The shop reopened in October, 1857, and he then went to work there, continuing until 1865, when he obtained an interest in the Philadelphia Hardware & Malleable Iron Works. In 1871 the firm became known as Carr, Crawley & Devlin. His firm continued in business until 1880, when Mr. Devlin retired. Four years after the dissolution, Carr & Crawley failed and in 1892 the company was taken over by Mr. Devlin and associates.

THOMAS DEVLIN

Mr. Devlin had been very active in a number of business organizations, including the Philadelphia Foundrymen's Association, of which he had long been president, the National Association of Foundrymen, the American Foundrymen's Association, of which he was an honorary member, the Hardware Merchants' and Manufacturers' Association, the Engineers' Club of Philadelphia and the Manufacturers' Club. He has seen many changes in the foundry business, including an advance in wages from $1.50 a day for a ten or eleven hour day, to $7.20 for an eight hour day. In the foundry and finishing department in which he started to work, there were 50 employees, while the three companies with which he was connected at the time of his death can give employment to from 1800 to 2500. In talking with a representative of THE IRON AGE last year about the evolution in the use of pig iron, Mr. Devlin said: "All of the old foundrymen thought they must have Scotch iron in the early days to produce good machinery and hardware castings. Then they used pig iron to make malleable iron castings which was made in New York and known as Sterling, and we thought the 'jig was up' when we couldn't get it. Later we discovered that good iron was being made from Lake Superior ore. We also used some Crown Point iron in our mixture for malleable purposes. All came by rail, except some which we imported from Sweden. We have thought that recent prices for pig iron were the highest in history. I remember when the company had to pay $60 for malleable pig iron in the early days; it was smelted with charcoal and hence the high cost. Lehigh Valley irons were also popular."

Mr. Devlin had 11 children, eight of whom are still living. Two sons were associated with him: William J. Devlin, vice-president and manager of the plants at Third and Lehigh avenues, Philadelphia, and Burlington, N. J., and Frederick M. Devlin, vice-president and treasurer, located at the plant at Ninth and Jefferson streets, Philadelphia.

MAHONING VALLEY MARKETS

Sheets Stabilizing Below Recent Top Prices—Pig Iron Prices Somewhat Softer

YOUNGSTOWN, OHIO, June 27.—Makers predict that the $35 sheet bar price, named to apply on July shipments, will extend throughout the third quarter. In this territory sheet bar production is running largely to open hearth grades, because of the scarcity of Bessemer steel.

Demand for merchant bars exceeds supply, with prices for the most part at a 1.70c. minimum, this representing the base price applying on new tonnages accepted by the chief independent maker in the Mahoning Valley.

Seasonal requirements for formed roofing products, ordinarily manifest in July and August, are beginning to be noteworthy, especially from Southern buyers. Not all makers are obtaining 3.30c. and 4.30c. for black and galvanized sheets respectively, and the willingness of some producers to enter tonnages below these quotations is causing others to fall in line. There is accordingly some question as to the stability of the higher prices now prevailing in the sheet market. Stabilization of sheet bar prices at $35 is another factor militating against the higher range on sheet prices.

Some shortage in lower-priced ranks of hot mill workers has proved an impediment to operations that is likely to become more pronounced as the thermometer climbs, but this condition has not yet retarded production to any large extent. Valley sheet capacity is likely not engaged in excess of 95 per cent actually, as a number of mills are usually down for repairs. Last week, for instance, all sheet units in the Valley were scheduled with exception of the two heavy jobbing mills at the Niles plant of the Republic Iron & Steel Co. Several units were idle, however, at the Thomas works of the Brier Hill Steel Co., while one mill failed to get under way at the company's Empire plant, which resumed, following a prolonged shutdown.

Sheet mill bookings extend anywhere from four to six weeks, while deliveries on full finished stock are impossible under two months on new business. Automobile seconds are picked up as fast as they accumulate and command from 4.25c. to 4.50c., as compared with 4.75c. for prime stock, base gage. Common seconds are likewise being readily absorbed by certain manufacturing consumers because of their lower cost, and the sold-up condition of the market on primes. Plate ends, also, are being taken by pressed steel interests because of their adaptability for smaller pressed sections.

Some Weak Spots in Iron Market

Some price weakness is developing in spots in the iron market, both standard basic and foundry grades having recently been sold at $24. Expected entrance of merchant interests into the market for third quarter tonnage will relieve the pressure which has been felt in this market. Lower assembly charges on raw materials and reduced ore prices will likewise have some effect on the market. Some of the Valley plants have sizable ore stocks and the reduction in cost of ore and its transportation will not be reflected in costs for some time.

A steelworks iron producer, which has been making a careful compilation of its iron costs, finds that $19 represents a fair average. This company owns its own ore and substantial interest in Lake steamship carriers, and its costs are therefore lower than those of some merchant interests not self-contained in these

respects. Under existing conditions, it will cost some merchant producers $20 to $21 per ton, this maker figures.

One group of interests predicts that basic iron and other grades will early stabilize at $23, or $2 per ton below prices recently prevailing. Another prophesies that iron may go still higher and possibly reach $27, contingent to a large degree upon the fuel situation.

Scrap prices show little weakness. An independent which bought scrap and pig iron recently in anticipation of possible suspension of its blast furnace, paid as high as $19 for heavy melting. Heavy demands for scrap metals by melters in the Valley, as well as insistence upon close adherence to specifications, is held as the reason why prices at Youngstown and Warren are higher than consumers pay in Pittsburgh or Cleveland. Last month, for instance, 640 cars of scrap were rejected in this territory, and the material was shipped into a nearby district, where it was consumed. Rejections have reached as high as 2200 cars per month.

TESTING MATERIALS SOCIETY

Annual Meeting in Progress at Atlantic City—The Year's Record

ATLANTIC CITY, N. J., June 27.—The American Society for Testing Materials is holding its annual meeting this year at the Chalfonte-Haddon Hall Hotel.

The annual report of the executive committee proved the year was one of exceptional activity among the various standing committees. It resulted in a volume of committee reports, seldom if ever exceeded in the history of the society in respect to importance. Of the 40 standing committees, 35 presented reports at this year's meeting and the remaining five gave brief reports to the executive committee indicating progress. The reports comprised about 720 pages, including recommendations for the proposed revisions of 23 standards, of which two have been previously reported; adoption of 12 tentative standards as standard; the acceptance of 54 proposed new standards as tentative; and the proposed revisions in 44 tentative standards to be continued as tentative.

The total membership at the annual meeting this year passed the 3000 mark and is now 3030. The net increase for the year was 122 members, as compared with 154 the previous year. Two years ago the net increase was 273.

The report states that two new committees have been organized since the last annual meeting: Committee D-15 on thermometers with W. H. Fulweiler, chief chemist United Gas Improvement Co., Philadelphia, as chairman, and Committee B-3 on corrosion of non-ferrous metals and alloys, with E. C. Lathrop, chemical department, E. I. du Pont de Nemours & Co., Wilmington, Del., as chairman. The committee on electrical standards was discontinued on its own recommendation and it was decided that it was inexpedient to attempt the organization of a standing committee on heavy chemicals at this time. The secretary-treasurer is investigating the possibilities arising from the suggestions that the society organize committees on ferroalloys, asbestos products, slate and glue.

An interesting feature of this year's report is a publication of a chart showing diagrammatically the committee organization of the society. It brings out in an interesting way the relationship between the various standing committees and shows how four of these committees act as administrative committees, as well as in an advisory capacity, to the executive committee. It also shows how the co-operative work of the society ties in through the executive committee with other societies. There is also published a chart showing diagrammatically the organization of the work of the executive committee and the classification of and the responsibility for the various activities of the secretary-treasurer.

Considerable progress has been made in the distribution of translated standards. During the year in English-French editions 61 of the society's specifications have been published by the United States Department of Commerce, in accordance with previous agreement, the distribution of the copies being made by the department to those countries where the translations are applicable. Plans are being made for the translation of about 40 of these specifications into Portuguese, and the printing of an English-Portuguese edition for use in Brazil. During the past year publication of the *Proceedings* of the society included 1197 pages, together with the issuing of the book of A. S. T. M. standards embracing 890 pages.

As to the rotation of annual meetings, the report states that an analysis of a questionnaire on this subject, issued shortly after the last annual meeting, had indicated that 305 members favored the plan of holding annual meetings in different places in succeeding years, while 182 opposed this plan.

Past-president J. A. Capp was for three years one of the society's representatives on the American Engineering Standards Committee. The death of past-president A. W. Gibbs created a vacancy to be filled by appointment during the annual meeting.

Officers Elected

The officers elected are as follows:

President, Dr. George K. Burgess, chief of the division of metallurgy, Bureau of Standards, Washington.

Vice-president, W. H. Walker, professor of chemical engineering, Massachusetts Institute of Technology, Cambridge, Mass.

Members of the executive committee, D. M. Buck, metallurgical engineer, American Sheet & Tin Plate Co., Pittsburgh; W. M. Corse, division of research extension of the National Research Council and consulting engineer International Nickel Co.; W. K. Hatt, professor of Civil Engineering, Purdue University, Lafayette, Ind., and J. R. Onderdonk, engineer of tests, Baltimore & Ohio Railroad, Baltimore.

President C. D. Young, general supervisor of stores, Pennsylvania Railroad, Philadelphia, in his address on Tuesday evening, June 27, referred to the fact that this year marks the twenty-fifth anniversary of the existence of the society. He recounted briefly the history of the Society. At present, he said, more than one-fourth of its members are actively devoting themselves to committee work, and many of those not so situated as to be able to give the time required for such work are contributing through papers to the advancement and knowledge of engineering materials and approved methods for testing them.

"If I were asked what is the most characteristic feature of our Society, I would answer that it is the independence of its members from pre-conceived notions and arbitrary standards."

"We point with just pride," he said, "to the abundant evidence that when our allied engineering associations desire to incorporate specifications as a portion of their work, they adopt ours. As conclusive evidence of this fact we find our standard materials specifications in the boiler code of the American Society of Mechanical Engineers, our joint work on cement in the American Society of Civil Engineers, and our standards covering the quality of and tests for certain electrical materials in the standards of the American Institute of Electrical Engineers. More recently the American Engineering Standards Committee has named this society as sponsor for six standardization projects and has adopted as American standards or tentative American standards fourteen specifications promulgated by us. The United States Department of Commerce, recognizing the value of the work of this society, has translated and broadcasted through its various consulates 61 of our standards translated into Spanish and French, and the translation is now contemplated of about forty of them into Portuguese for use in Brazil."

Beginning in 1902, receipts from the sale of publications amounting to $54. The amount has steadily grown until, for the past year, the revenues from that source amounted to $18,000, representing more than one-fourth of the financial income of the society. "The fact that they are buying them voluntarily conclusively proves their worth."

The society should, he suggested, strongly support any movement which will again create an international association of testing engineers.

German Steel Prices Again Advanced

Increases Average 12 Per Cent on Leading Products—Further Charges to Be Added if Coal Goes Higher

(*By Radiogram*)

BERLIN, GERMANY, June 26.—The Steel Syndicate has raised prices to the following, in marks per metric ton: Ingots, 7960; blooms, 8670; billets, 8965; slabs, 9190; structural steel, 10,460; bars, 10,640; wire rods, 11,470; thick plates, 11,930; medium weight plates, 13,570; thin plates, 14,450; thinner, under 1 mm. (19 gage, United States plate standard), 15,060.

These prices are announced as good to the end of July, but supplementary supercharges will be added in case there is any further increase in coal prices.

[Figuring present exchange at 0.29c. per mark and pre-war exchange at 23.82c. per mark, the latest change in prices gives rise to the following table, based on that given on page 1601, THE IRON AGE, June 8.—*Editor*]:

	June 26		April 1	Pre-war	
	Marks	Dollars†	Marks	Marks	Dollars†
Ingots	7,960	23.46	7,170	82.50	19.34
Blooms	8,670	25.55	7,775	87.50	20.51
Billets	8,965	26.42	8,010	97.50	22.85
Slabs	9,190	27.08	8,200	95.00	22.27
		C. per Lb.			C. per Lb.
Structural steel	10,460	1.38	9,325	110.00	1.19
Bars	10,640	1.40	9,500	98.00*	1.06
Universal shapes	.....	.....	10,355	118.50*	1.28
Bands	.....	.....	10,580	105.00	1.13
Wire rods	11,470	1.51	10,265	117.50	1.27
Heavy plates	11,930	1.57	10,650	105.00	1.13
Medium plates	13,570	1.78	12,140	110.00	1.19
Light plates	14,450	1.90	12,770	125.00	1.35
Sheets	15,060	1.98	.....	.....	.....

*Average. †Per gross ton.

JAPAN AGAIN BUYING SHEETS

Conditions Improved—German Scrap Shortage —No Competition Expected from Foreign Cotton Ties

NEW YORK, June 27.—Although export trade with South American countries continues to show improvement, orders are small and largely confined to merchant buying of wire, nails and some sheets, both black and galvanized. The Chinese market is dull, caused chiefly by the unsettled political conditions, buyers holding off, pending settlement of the political disturbances. What little purchasing appears is of the hand-to-mouth variety.

In the past fortnight one export company dealing exclusively with China has booked orders for about 60 tons of electrolytic copper for Hongkong and several carloads of wire, wire nails and black sheets of light gage to Harbin, Manchuria. Shanghai during the past period purchased 80 tons of steel pipe and a carload of black sheets. The British sellers in the Chinese market have cut their steel prices 10 shillings per ton, according to Commercial Attaché Julean Arnold, who also reports heavy copper purchases for minting.

Japan Buys Black Sheets

The Japanese market, although dull and showing but slight change over the conditions of past weeks, is evidently taking a renewed interest in black sheets. In addition to the current inquiries, exporters in New York have in the past week taken orders for a total of about 1000 tons of light gage black sheets. Besides the black sheet inquiries there is an inquiry from Japan for about 500 tons of high carbon wire rods. At present there is a strong interest manifest in sulphate of ammonia, for use in fertilizer making and for re-exporting to the Dutch East Indies. The revival of business conditions following the depression in Japan in 1920 was preceded by heavy buying of sulphate of ammonia.

Importation of steel into Japan has been increasing since January of this year, according to the American commercial attaché at Tokio, receipts in February having amounted to 69,719 tons compared with 46,250 tons in January and receipts in March totaling 94,601 tons. It is pointed out that there has also been an increased demand by consumers, which fact has reduced stocks in Tokio, Yokohama, Osaka and Kobe to 112,707 tons on hand at the end of March, a decrease of 16,332 tons from the February figure. These figures include bars, sheets, plates and wire.

Although German rail mills are submitting bids on the rail inquiry of the South Manchuria Railway Co. for about 6300 tons of 100-lb. rails, in the main German mills are filled up on rails for about six months. The shortage of scrap is intense and shows but little improvement, according to reports received by representatives of German sellers in the United States. One large interest employing about 70,000 workers is said to be running behind on scrap at the rate of 20,000 tons per month. This is the condition despite purchases of scrap being made by German mills in other European countries.

So acute has the shortage been that British ships sold for dismantling were purchased by Germany at $4 per deadweight ton to be broken up for the steel scrap. At present one buying and selling office for a German interest reports that it is buying from three to five times as much raw material for export to Germany as it is selling finished products on import account. None of this present buying, however, includes scrap, American prices being too high.

New price schedules, which went into effect about a week ago in German mills, average a 12 per cent increase on all items. This was in anticipation of an increase to be made in the price of coal of about 100 marks per ton. An increase of about 25 per cent in railroad freight rates is effective July 1, to offset a 20 per cent wage increase granted railroad workers.

Foreign Cotton Tie Competition Doubtful

It is considered extremely doubtful that there will be any condition similar to the competition during last year's cotton tie season from foreign cotton ties. About the best prices reported on cotton ties, not only from German but from Belgian, French and British sellers, is about $1.39 per bundle, f.o.b. Hamburg, Antwerp or Liverpool and it is believed that the American market will open at a price not to exceed $1.35 per bundle. Of the cotton tie stocks in this country of foreign origin, probably the largest was held by one German interest and totaled 100,000 bundles imported last December. Of this stock, only about 30,000 bundles are left for the opening of the season, and it is considered doubtful among German importers that delivery could be made on any large quantity. Another representative of German mills reports a stock of about 18,000 bundles carried over from last season and there is a rumor of a shipment of 100,000 bundles to importers, scheduled to arrive the first week in July.

Iron and Steel Markets

COAL STRIKE SETTLEMENT

More Hope at Pittsburgh—Steel Prices Still Advancing

Labor Scarcity at Steel Works More Marked —General Situation More Tense

The strong efforts of the Administration to end the coal strike and some further gains in coal and coke production at non-union mines in western Pennsylvania have made the Pittsburgh steel trade more ready to believe a settlement is not far off. At the same time actual transactions in steel have been at advancing prices, the dominant factor in the market being the expected continuance of high-cost conditions.

It is conceded that a coal strike settlement would advance wages that have been paid at non-union mines. At the same time labor scarcity, which is more in evidence at steel plants, particularly in the Chicago district, points to higher labor costs at no distant day.

Both blast furnaces and steel plants are buying increasing quantities of coal in the open market at high prices, some of these contracts covering periods of weeks. This situation causes makers to name higher prices and to take business sparingly. Should the coal strike end soon it is predicted that a large volume of new orders would come to the mills.

The 10 per cent freight reduction effective this week will mean larger shipments in early July from blast furnaces and rolling mills. But the holiday will curtail output at some steel plants.

No formal change has been made in Steel Corporation prices, but an upward tendency is seen in some of its quotations on bars and plates given to manufacturers seeking protection. Independent companies are quoting $2 to $5 above the Steel Corporation level on plates, shapes and bars where early shipment is required.

The building trades, railroad car builders and automobile plants are bidding for labor in the Chicago district against blast furnaces and steel works, and the latter find it hard to maintain working forces. Adoption of the three-shift day would add to the problem unless immigration restrictions were relaxed.

Steel companies in the Pittsburgh and Youngstown districts have increased their pig iron output. The Carnegie Steel Co. now has 39 furnaces in blast, or only two less than it planned to have in when the coal strike started. Steel output has been well maintained in the week. A Youngstown company has started up its Bessemer department, after a long shutdown.

Railroad car orders have reached a total of 92,000 for the year and 16,000 cars are pending. The Pennsylvania inquiries may run to a total of 30,000.

Birmingham, England, has bought 1000 tons of girder rails from a Belgian mill, the price being low enough to shut out the American mill which has captured this Birmingham business on other occasions by bidding under British makers.

In the pig iron market a slight easing in the price of foundry iron is reported at Pittsburgh and Cleveland. One Southern furnace, about to start up, sold considerable iron at $18, or 50 cents below the recent minimum, in order to get a backlog. A number of furnaces are willing to sell for fourth quarter at current prices. At Chicago good sized sales of charcoal iron have caused an advance of $2 per ton.

The feverish buying of ferromanganese has kept up, and fully 15,000 tons of the British product has been taken. In the Chicago district the price has reached $70, New Orleans.

The first shipment of iron ore on a 75,000 ton purchase by a Philadelphia steel company has just come in. A like quantity of Swedish ore has been bought by the same company. Both ores are laid down at considerably less than Lake Superior ore prices.

German finished steel products were advanced 12 per cent on June 22 and still higher prices will be named if coal goes up, as is now expected.

Three of the largest consumers of copper have been in the market in the past week for a total of 10,000,000 pounds, practically all of which was bought at 13⅞c.

Structural steel lettings of the past week exceeded 21,000 tons and the total for four weeks in June appears somewhat greater than the total for the corresponding period of May. New projects under negotiation, involving over 11,000 tons, show a surprising continuance of activity in fabricated steel work.

THE IRON AGE composite price of finished steel has risen to 2.169c. per lb., compared with 2.141c. for three weeks past, 2.062c. on Jan. 1 and 2.607c. a year ago. The pig iron composite remains at $24.05, after having advanced for three successive weeks. This compares with $18.60 on Jan. 1 and $21.42 a year ago.

Pittsburgh

Makers Slows to Sell—Semi-finished Steel Higher—Premiums on Finished Products

PITTSBURGH, June 27.

While the actual turnover of steel has dwindled slightly in the past week, this reflects a disinclination on the part of manufacturers to add to their already heavy obligations rather than a lack of demand. Demand is strong, but it is difficult for the steel makers to figure as far ahead as usual with the coal strike still on, and a scarcity of labor becoming more pronounced, not to mention a possibility of labor troubles among the railroad workmen growing out of the wage reduction effective Saturday and the threat of the car shortage in the event that the coal strike is settled and the movement of winter stocks of coal is heaviest about the time the crops are moving marketward.

Because of the efforts of the Government to bring about a settlement of the coal strike, hopes run strong of an early conclusion of this difficulty and some close observers of the situation go so far as to predict the strike will be over by July 15.

There are reports that efforts to increase production of steel are rendered impossible by the labor shor-

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	June 27, 1922	June 20, 1922	May 30, 1922	June 28, 1921
No. 2X, Philadelphia‡	**$27.82**	$27.32	$26.26	$25.50
No. 2, Valley furnace†	24.00	24.00	24.00	21.00
No. 2, Southern, Cin'ti†	23.00	23.00	22.50	**26.00**
No. 2, Birmingham, Ala.†	*18.00*	18.50	18.00	21.50
No. 2 foundry, Chicago*	23.50	23.50	23.00	20.00
Basic, del'd, eastern Pa.	25.00	25.00	25.00	23.50
Basic, Valley furnace	25.00	25.00	25.00	20.50
Bessemer, Valley, del. P'gh	26.96	26.96	26.96	24.46
Malleable, Chicago*	23.50	23.50	23.00	20.00
Malleable, Valley	24.50	24.50	24.50	22.50
Gray forge, Pittsburgh	25.46	25.46	25.46	21.96
L. S. charcoal, Chicago	29.00	29.00	29.00	37.50
Ferromanganese, seaboard	67.50	67.50	65.00	70.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$40.00	$40.00	$40.00	$47.00
Bess. billets, Pittsburgh	35.00	35.00	35.00	37.00
O.-h. billets, Pittsburgh	35.00	35.00	35.00	37.00
O.-h. sheet bars, P'gh	35.00	35.00	35.00	39.00
Forging billets, base, P'gh	40.00	40.00	40.00	42.00
O.-h. billets, Philadelphia	40.74	40.74	40.77	42.74
Wire rods, Pittsburgh	**40.00**	38.00	38.00	48.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	1.70	1.70	1.70	2.20
Light rails at mill	**1.60**	1.50	1.50	2.10
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	1.96	1.96	1.96	2.25
Iron bars, Chicago	1.75	1.75	1.70	2.15
Steel bars, Pittsburgh	1.70	1.70	1.60	2.00
Steel bars, Chicago	1.75	1.75	1.70	2.38
Steel bars, New York	**2.08**	1.98	1.88	2.38
Tank plates, Pittsburgh	**1.70**	1.60	1.60	1.90
Tank plates, Chicago	1.75	1.75	1.70	2.28
Tank plates, New York	**2.08**	1.98	1.98	2.28
Beams, Pittsburgh	**1.70**	1.60	1.60	2.00
Beams, Chicago	1.75	1.75	1.70	2.38
Beams, New York	**2.08**	1.98	1.98	2.38
Steel hoops, Pittsburgh	2.40	2.40	2.25	2.50

Sheets, Nails and Wire,	June 27, 1922	June 20, 1922	May 30, 1922	June 28, 1921
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	3.15	3.15	3.15	3.75
Sheets, galv., No. 28, P'gh	4.15	4.15	4.15	4.75
Sheets, blue an'l'd, 9 & 10	2.40	2.40	2.40	2.85
Wire nails, Pittsburgh	2.40	2.40	2.40	3.00
Plain wire, Pittsburgh	2.25	2.25	2.25	2.75
Barbed wire, galv., P'gh	3.05	3.05	3.05	3.65
Tin plate, 100-lb. box, P'gh	$4.75	$4.75	$4.75	$6.25
Old Material, Per Gross Ton:				
Carwheels, Chicago	$18.25	$18.25	$18.00	$13.25
Carwheels, Philadelphia	**17.50**	17.00	17.00	18.00
Heavy steel scrap, P'gh	17.00	17.00	17.50	12.00
Heavy steel scrap, Phila.	15.00	15.00	15.00	11.00
Heavy steel scrap, Ch'go	**14.75**	14.50	14.50	10.25
No. 1 cast, Pittsburgh	**19.00**	18.50	18.50	16.00
No. 1 cast, Philadelphia	19.00	19.00	18.50	17.00
No. 1 cast, Ch'go (net ton)	**16.50**	15.75	16.00	12.50
No. 1 RR. wrot, Phila.	17.00	17.00	17.00	13.50
No. 1 RR. wrot, Ch'go (net)	**13.25**	12.50	12.75	9.50
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	**$7.50**	$6.50	$6.00	$3.00
Foundry coke, prompt	**8.00**	7.00	6.50	4.25
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	13.75	13.75	13.87½	12.62½
Electrolytic copper, refinery	13.50	13.50	13.62½	12.62½
Zinc, St. Louis	*5.27½*	5.37½	5.25	4.25
Zinc, New York	*5.62½*	5.72½	5.60	4.75
Lead, St. Louis	*5.55*	5.60	5.45	4.15
Lead, New York	*5.80*	5.85	5.75	4.40
Tin (Straits), New York	*31.00*	31.37½	31.25	29.00
Antimony (Asiatic), N. Y.	*5.00*	5.10	5.37½	4.87½

*The average switching charge for delivery to foundries in the Chicago district is 70c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.
The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, June 27, 1922, Finished Steel, 2.169c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel

June 20, 1922,	2.141c.
May 29, 1922,	2.127c.
June 28, 1921,	2.607c.
10-year pre-war average,	1.689c.

Composite Price, June 27, 1922, Pig Iron, $24.05 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

June 20, 1922,	$24.05
May 29, 1922,	23.71
June 28, 1921,	21.42
10-year pre-war average,	15.72

tage, and until the weather gets cooler not much improvement in this direction can be expected. In this connection it is reported that efforts are on foot seeking a modification of the immigration law which will permit the re-entry into the country of thousands of foreign workmen who left this country during the depression and who now are barred admission by the restrictions as to the numbers which may come in.

Prices continue to grow stronger, while preferential customers still are able to obtain accommodations on the heavy tonnage products as low as 1.60c., the more common minimum now is 1.70c. The market is much firmer on light rails than it has been, with the two largest producers in this district now asking 1.75c., base. Meanwhile, premiums for early deliveries still are being obtained on sheets, despite the action of the leading interest in extending present quotations to cover August and September business.

Semi-finished steel is extremely hard to obtain and still higher prices are likely since there is no promise of an early decline in costs and there are more buyers than sellers at present. The most recent business in wire rods was at $40, and it is expected that in view of the fact that billets are not available below $35, the price for third quarter tonnages in rods will be established at $43, this being considered a fair alignment with billet values.

Merchant pipe for early shipment is extremely scarce but as yet no very well-defined effort has been made to advance prices. A large maker of seamless steel tubes has announced an advance, effective Friday, of $6 per ton on almost all sizes of merchant tubes and of $10 per ton on locomotive and superheater tubes and mechanical tubing.

The coal situation does not seem to be affecting mill and furnace operations to any extent in this and nearby districts. The Carnegie Steel Co., indeed, will blow in the one idle blast furnace at New Castle, Pa., late this week, while the National Tube Co. has started up the one furnace at its Lorain, Ohio, works which has been down. Carnegie Steel Co. by the end of the week will have 39 furnaces in blast, only two less than it planned on having in when the coal strike started. The National Tube Co. now has 9 of its 11 blast furnaces active. It is expected that ingot production of the Carnegie Steel Co. this week will exceed 80 per cent of capacity. The Mary furnace of the Sharon Steel

Hoop Co., Lowellsville, Ohio, has gone in on coke reported as coming from West Virginia.

The pig iron market remains quiet without much change in prices. The scrap market has been featured by some fairly large sales of cast scrap for open hearth use at prices 50c. to $1 per ton above recent levels.

Pig Iron.—Interest centers chiefly in foundry iron, which strangely enough is a shade weaker in price than it was recently. The Westinghouse Electric & Mfg. Co. has bought about 700 tons more for its Cleveland works, paying $24 both at Valley and Cleveland furnaces for No. 2 grade. The Union Radiator Co., Johnstown, Pa., has an inquiry out for 300 tons of No. 2 foundry for July shipment and the A. M. Byers Co. wants 500 tons of gray forge iron. No recent business in foundry iron has been done at above $24 for the base grade, and a higher quotation no longer seems warranted. The inquiry of the Monongahela Iron & Steel Co., Paden City, W. Va., for 750 tons of Bessemer iron is the only important one in the steel making grades now before the market. The freight rate for delivery to the Cleveland or Pittsburgh districts as of July 1 goes to $1.76 per ton, as against the present rate of $1.96.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.96 per gross ton:

Basic	$25.00
Bessemer	25.00
Gray forge	$23.50 to 24.00
No. 2 foundry	24.00
No. 3 foundry	23.50 to 24.00
Malleable	24.50

Ferroalloys.—The heavy demand for ferromanganese inspired by the recent action of the Senate in restoring the House rate on manganese ore in the new tariff continues and the market maintains a very strong tone, although prices are not quotably changed. The great bulk of the business has been in British material, which has been sold at a flat price of $67.50 c.i.f. Eastern seaboard, for 80 per cent material. The market on domestic ferromanganese is purely nominal, as little or none figures in current transactions. Domestic producers are among the purchasers of the English product which they are applying against contracts, in part, this course being dictated by the very high cost of production in this country, due to the extremely high prices now prevailing for coke. Quotations on spiegeleisen lately have been finding some basis in sales. A Valley steel maker has bought in the neighborhood of 300 tons of average 20 per cent material at $36, furnace, and we also note small sales of 16 to 19 per cent at $35, furnace. Interest in other ferroalloys is extremely limited, with prices unchanged.

We quote 78 to 82 per cent ferromanganese, $67.50 c.i.f. Atlantic seaboard for domestic and $67.50 for English. Average 20 per cent spiegeleisen, $36 furnace; 16 to 19 per cent, $35 furnace; 50 per cent ferrosilicon, domestic, $55 to $50 furnace, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $41.50; 11 per cent, $44.80; 12 per cent, $48.10; 13 per cent, $52.10; 14 per cent, $55.10; silvery iron, 6 per cent, $30; 7 per cent, $31; 8 per cent, $32.50; 9 per cent, $34.50; 10 per cent, $36.50; 11 per cent, $39; 12 per cent, $40.50. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $4.06 per gross ton.

Structural Material.—Buyers are experiencing considerable difficulty in entering new business at less than 1.70c., as all of the mills are heavily committed and are indifferent about additional business at a lower price. Most of structural awards to local fabricating shops are for small jobs but the amount of prospective business still is heavy. Prices are given on page 1859.

Plates.—It is possible that preferred buyers still might be able to obtain accommodation as low as 1.60c. base, Pittsburgh, but the common minimum quotation now is 1.70c., with as high as 1.80c. being mentioned in connection with small tonnages wanted promptly. Prices are given on page 1859.

Sheets.—Demand is still on a heavy scale and while the recent action of the American Sheet & Tinplate Co. in extending present prices to cover August and September business has tended to check the upward movement of prices, independent mills still are able to obtain premiums of $2 to $3 per ton on early deliveries. All makers have heavy obligations and are experiencing some difficulty in catching up with them because of the scarcity of labor. Prices are given on page 1859.

Tin Plate.—Demand is good but lacking in urgency, this being ascribed to the fact that container manufacturers quite generally anticipated their requirements this year and demand from the packers for cans has not yet reached its heaviest proportions. The established price of $4.75 per base box, Pittsburgh, is closely observed. Mill operations show no material let down other than is occasioned by a shortage of labor.

Hot-Rolled Flats.—Although the Steel Corporation still is said to be taking orders from regular customers at 2.25c., base, Pittsburgh, it is evident that this price applies only on orders for indefinite delivery, since independent companies are having little trouble in obtaining $3 per ton more for definite deliveries and in material of light gage and narrow width, they are getting as high as 2.60c. Makers of cotton ties here have not yet opened their books and seem inclined to defer action until a later date than usual. A clearer line can be had on the probable requirements a little later on and another reason for delay is that the ties are not actually required until along about the middle of August. Suggestions that German makers would ship 100,000 bundles of ties to this country this year are regarded as somewhat exaggerated. Some German ties are understood to have already reached this country and are being marketed at a price to be named later when the price of American ties is established. The report is that the German ties are to be sold about 5c. per bundle under the price of the domestic product.

Wire Rods.—The old base of $38 for common soft rods rapidly is disappearing and refers either to shipments on contracts which have less than a week to run, or to small tonnages which makers can spare to regular customers. On strictly new business, $40 Pittsburgh has been done, and on third quarter tonnages some makers feel that the price should be $43 to overcome the increase in costs produced by the advance in fuel prices and labor charges. Moreover, it is asserted that a premium of $8 a ton on rods over large billets is little enough and with large billets at $35 this would mean $43 for rods. The Steel Corporation has not yet announced prices for either July or the third quarter.

We quote No. 5 common basic or Bessemer rods $38, chain rods $38 to $40, screw stock rods $43 to $45; chain rods, $38 to $40; other rods of that character, $38 to $40. High carbon rods, $45 to $50, depending on carbons, per gross ton, f.o.b. Pittsburgh or Youngstown.

Wire Products.—A good business is being done, although the demand lacks the urgency noted in some of the other finished tool products. It has been frequently reported that the American Steel & Wire Co. soon would advance its price on wire nails to the independent level of $2.50 base per keg Pittsburgh, but confirmation is lacking. Independents generally are holding quite firmly to $2.50 for nails, but it is not denied that the Steel Corporation price has to be met in a good many localities. Prices are given on page 1859.

Billets, Sheet Bars and Slabs.—The Steel Corporation is moving with extreme caution with regard to naming prices for the third quarter, and independent mills which are taking business are confining bookings to July delivery. As nearly as prices can be appraised, the market is quotable at $35, Pittsburgh or Youngstown, for billets, sheet bars and slabs, with some producers unwilling to enter orders for sheet bars at less than $37.50. Producing costs remain high, since mills are running more and more on high-costing fuel, while the scarcity and increasing cost of labor is an influential factor.

We quote 4 x 4-in. soft Bessemer and open-hearth billets at $35; 2 x 2-in. billets, $35; Bessemer and open-hearth sheet bars, $35; slabs, $35; forging billets, ordinary carbons, $40, all f.o.b. Youngstown or Pittsburgh mills.

Cold-Finished Steel Bars and Shafting.—The recent price of 2c. base, Pittsburgh, for carload lots of cold-rolled and drawn steel bars has largely disappeared and all makers now are quoting a minimum of 2.10c., base, for carloads, with the usual extra of $5 per ton for less than carload lots. Demand is very active from the automotive industry, but there continues to be

very little interest in the market on the part of the agricultural implement and machine tool manufacturers. Most makers are having considerable trouble in obtaining full supplies of hot-rolled bars and this is causing some backing up of orders for cold-finished material. Ground shafting is unchanged at 2.50c., base, f.o.b. mill for carload lots.

Iron and Steel Bars.—Practically all makers of steel bars now are quoting a minimum of 1.70c. base, Pittsburgh, and while a price of 1.60c. has not entirely disappeared, it is either made to preferred customers or for very indefinite delivery. In a general way 1.70c. is minimum for specified shipments. Iron bars have moved upward, now being quoted at 2.20c. base, minimum, for refined iron bars in carload lots.

We quote steel bars rolled from billets at 1.60c. to 1.75c.; reinforcing bars, rolled from billets, 1.60c. to 1.75c. base; reinforcing bars, rolled from old rails, 1.50c. to 1.60c.; refined iron bars, 2.20c. in carloads, f.o.b. mill, Pittsburgh.

Steel Rails.—The railroads are reported to be specifying steadily on contracts for standard rails and it is generally expected that they will take out all they have ordered, and in the event that there is no trouble among the men growing out of the wage reduction, there is a possibility of additional orders. Light rails are in sharp demand for quick shipments from operators of coal mines that are running. The Jones & Laughlin Steel Co. still is quoting 1.60c. base on these sections, but the Carnegie Steel Co. and the Cambria Steel Co. now are quoting 1.75c.

We quote 25 to 45-lb. sections, rolled from new steel, 1.60c. to 1.75c. base; rolled from old rails, 1.50c. to 1.60c. base; standard rails, $40 per gross ton mill for Bessemer and open-hearth sections.

Iron and Steel Pipe.—Despite the care exercised in entering orders for merchant steel pipe, makers are finding it difficult to avoid falling behind in their obligations and buyers have much trouble in securing tonnages for early shipment. There is a satisfactory business in oil country goods and in line pipe. Demand for wrought iron pipe reflects the building activity throughout the country. Prices are extremely firm on both classes of goods, but we note no definite attempt to put them up. Discounts are given on page 1859.

Cold Rolled Strips.—Makers are getting all the business they care to take at the present price. Demand from the automotive industry is especially good. The price is unchanged at 4c. base, Pittsburgh.

Bolts and Nuts.—Makers in this district being chiefly dependent upon the railroads for business are not as busy as those in other districts having a more diversified trade. A fair amount of business is coming out from the railroads, however, and makers here are fairly busy. There is no change in prices. Discounts are given on page 1859.

Rivets.—Demand is brisk and coming from widely diversified sources. The recent advance in prices is firmly adhered to and is well established by sales. Prices and discounts are given on page 1859.

Spikes.—As yet a price of higher than $2.25 base per 100 lb. for standard spikes is more of an asking than a selling figure. Most makers remain at $2.25 base, and the demand at the moment is not heavy enough to sustain a higher figure. Prices are given on page 1859.

Steel Skelp.—The supply situation still is exceedingly tight and prices are very firm at the recent levels of 1.60c. to 1.65c. for sheared and 1.70c. to 1.75c. for grooved. Tonnages of narrow grooved skelp are very hard to find and for prompt shipment substantial premiums would have to be paid.

Boiler Tubes.—Effective June 29, the Pittsburgh Steel Products Co. advanced prices of seamless steel merchant boiler tubes $6 per ton, the advance embracing all sizes except 1¾-in., which remains unchanged at 36 per cent off list, for carload lots. This company also has advanced prices of seamless steel mechanical tubes one point, which is equivalent to $10 per ton and has made a corresponding advance in seamless steel locomotive and superheater tubes. Basis for the advance is found in the fact that there is an increasing demand, with the call for early shipment, and to meet the latter requirement it is necessary for producers to pay stiff advances over contract prices for steel. The market is fairly active in lap-welded steel boiler tubes and price concessions are slighter and less frequent than they were earlier in the year. High cost of fuel and higher labor charges are the sustaining influences on charcoal iron tube prices. Discounts are given on page 1859.

Coke and Coal.—Although the past few weeks has been marked by a constant increase in the production of beehive oven coke, the gain has been chiefly among furnace as distinct from merchant ovens, and the open market supply is exceedingly light. Hardly enough coke is available to establish a market but on such tonnages as have been moved, the market is quotable at $7.50 to $8 per net ton, ovens, for furnace grade and $8.50 for foundry grade for their usual users. Higher prices have been done but usually on sales to bakeries, lime burners, etc. Coal buyers have observed that by being in the market constantly, prices constantly move upward on them, consequently they are entering and retiring from the market frequently and prices fluctuate accordingly. On nearby coal the market is quotable at $3.75 to $4 at mines and Southern coal at $3.25 to $3.50 at mines.

Old Material.—Strength of the outside markets on the steel works grades still is without effect upon prices here. Steel makers in this district are generally out of the market and efforts to interest them in purchases have been rather futile. Heavy melting steel cannot be sold here above $17 to $17.25 and $16.50 is as high as some are willing to pay. Dealers cannot let go of yard stocks except at a loss at these prices and fresh supplies are not available at anywhere nearly as low with all outside markets netting much more. The market is dominated by the fuel situation, melters going slowly in the hope that with an easing in the fuel situation they may be able to put on additional blast furnaces and cut the consumption of scrap. Demand for foundry grades still is light and prices rather out of line with those for the steel works grades.

Cast scrap is very scare and is wanted by steel makers to replace pig iron. We note sales aggregating about 10,000 tons of No. 1 cupola size at $19, delivered Monessen, Pa. Heavy breakable cast scrap is quotable at $18.25 to $18.75 for open hearth use. Cast iron borings also are scarce and are held as high as $17, but at that price they are not attractive to melters, whose limits are $16 to $16.50.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows per gross ton:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh	$17.00 to $17.25
No. 1 cast, cupola size	19.00 to 20.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	17.00 to 17.50
Compressed sheet steel	15.00 to 15.25
Bundled sheets, sides and ends	14.00 to 14.55
Railroad knuckles and couplers	18.00 to 18.50
Railroad coil and leaf springs	18.00 to 18.50
Low phosphorus standard bloom and billet ends	20.00 to 21.00
Low phosphorus plates and other grades	19.00 to 20.00
Railroad malleable	16.00 to 16.50
Iron car axles	26.00 to 27.00
Locomotive axles, steel	24.00 to 25.00
Steel car axles	17.50 to 18.00
Cast iron wheels	17.00 to 17.50
Rolled steel wheels	17.50 to 18.00
Machine shop turnings	13.50 to 14.00
Sheet bar crop ends	18.50 to 19.00
Heavy steel axle turnings	15.00 to 15.50
Short shoveling turnings	14.25 to 14.75
Heavy breakable cast	18.25 to 18.75
Stove plate	14.00 to 14.50
Cast iron borings	16.00 to 16.50
No. 1 railroad wrought	14.50 to 15.00

Employers in Wisconsin paid $4,493,437 in workmen's compensation insurance premiums in 1921, compared with $6,037,213 in 1920, according to a special report of the Wisconsin workmen's compensation insurance board, which explains the decrease thus: "This reduction in earned premiums is attributable in large measure to the stagnation of business last year."

Chicago

Fuel Situation, Threatened Railroad Strike and Labor Shortage Cause Cautious Selling

CHICAGO, June 27.

Iron and steel producers find the present market situation a perplexing one. On the one hand they are trying to prevent a runaway market, knowing that an undesirable reaction would follow it, and on the other hand are afraid to add to their forward commitments because of the uncertain costs. The fuel situation is a source of increasing concern and is expected to develop into a real crisis before the first of August.

In the meantime both blast furnaces and steel works are finding it necessary to purchase increasing quantities of coal in the open market at high prices. As a result producers fear not only that their margins of profit will be wiped out but that they will again find themselves operating at a deficit. Even an early settlement of the coal strike, of which there appears to be no prospect at present, may not mean immediate relief from present fuel costs, as the natural consequence of such a development would be the release of a flood of orders now held back.

The fuel problem is not the only cloud on the industrial horizon. Notwithstanding the fact that the Railroad Labor Board has just rendered a decision outlawing the farming out of shop work by the railroads, thereby giving official recognition to the view of the shop crafts in that particular controversy with the carriers, the shop and maintenance of way unions have voted overwhelmingly for a strike, which is now scheduled for some time between July 15 and Aug. 1. The train service brotherhoods have been invited to join in the walkout, but as they are not affected by the wage reductions which become effective July 1, it is probable that they will not do so.

A third element of uncertainty confronting producers is an increasing shortage of labor. The building industry, the automobile manufacturers, the railroad car builders and others are bidding against the steel works and furnaces for labor, with the result that they are finding it difficult to hold enough men to maintain their present operations.

In view of these various complexities it is not surprising that a policy of cautious selling is becoming general. An important local producer, which has relined a blast furnace, hesitates to blow it in, not because business is not in sight, as the exact contrary is the case, but because it is feared that costs would aggregate $25 or more a ton, or considerably above the present selling price of merchant iron. That uncertainty as to the future is being taken into account in other producing centers, as well as in this district is indicated by the unusual phenomenon of an Eastern mill quoting $2 a ton higher on a Chicago district inquiry for 2000 tons of structural shapes than on inquiries for 100 to 300 tons.

Demand for finished steel shows no signs of abatement. New tonnages booked and orders passed for entry at the mills are heavy and much business offered is being allowed to pass by. A leading local producer could have booked 200,000 tons additional in the past six weeks if its capacity had been equal to the demand. Automobile plants are breaking production records. The building industry is exceedingly active. Railroad car and equipment manufacturers continue to book large orders and a wide variety of miscellaneous manufacturers are busy. It is apparent that steel is going direct into consumption, a fact which is further substantiated by the increasing number of orders which are going to Eastern mills. On plates, shapes and bars Eastern producers are getting from 1.75c. to 1.90c., Pittsburgh, for three to six weeks delivery.

Steel works production in this district is slightly less than a week ago. The Illinois Steel Co. continues to operate at 85 per cent of capacity, but the output of the Inland Steel Co. has dropped to 65 per cent.

Pig Iron.—Demand is still active, but selling is growing more cautious as fuel and labor costs become more uncertain. Fully 75 per cent of the blast furnace capacity represented by the leading Northern merchants is now in blast and it is unlikely that any more furnaces will be put in so long as the coal strike is in effect. A local railroad equipment manufacturer has closed for 3000 tons of foundry iron for third quarter and other orders ranging from 100 to 1000 tons have been placed with local sellers. A western Michigan melter is in the market for 1000 to 2000 tons of malleable iron for third quarter shipment and there are a number of smaller inquiries for both third and fourth quarter deliveries. Southern iron is available from one source at $18, base Birmingham, or 50c. less than the recent minimum. All other Southern furnaces are quoting $20 base. Recent sales of Southern iron in this territory include one lot of 1000 tons, two of 600 tons, two of 200 tons and one of 300 tons, for both immediate and third quarter deliveries. Charcoal furnaces are heavily booked and have again advanced their prices, this time to $28.50, base furnace. A local melter has purchased 500 tons of 15 per cent electrolytic ferrosilicon. Electrolytic producers are now well sold up with the result that silvery and Bessemer ferrosilion grades are exceedingly firm.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include a switching charge averaging 70c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago		$32.00
Northern coke, No. 1, sil. 2.25 to 2.75	$24.00 to	24.50
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	23.50 to	24.00
Northern high phos	23.50 to	24.00
Southern No. 2	23.92 to	24.67
Malleable, not over 2.25 sil	23.50 to	24.00
Basic	23.50 to	24.00
Low phos. Valley furnace, sil. 1 to 2 per cent copper free		35.00
Silvery, sil. 8 per cent		37.82

Ferroalloys.—Buying of ferromanganese has been very heavy and prices have firmed up to a minimum of $70, base, New Orleans. Effective July 1, the freight from New Orleans to Chicago will be $7.56. Spiegeleisen is also more active and specifications against 50 per cent ferrosilicon contracts are heavy. New buying of the latter is very light, because most users are covered by contracts. A recent test of the market indicates, however, that the present going price is about $62.50, delivered.

We quote 78 to 82 per cent ferromanganese, $78.40, delivered; after July 1, $77.56; 50 per cent ferrosilicon, $62.50, delivered; spiegeleisen, 18 to 22 per cent, $46.50 to $47, delivered.

Freight Rates.—Effective July 1, the freight on finished steel from Pittsburgh to Chicago will be 34c. per 100 lb. The rate on pig iron from the Valleys will be $4.81 a ton, and from Birmingham to Chicago an even $6. Rates from Northern charcoal furnaces to Chicago will average $3.15 as against the present average of $3.50.

Bars.—The demand for mild steel bars shows no let-up with the result that local mills are losing business which they could have taken in, had they had the capacity. One important producer estimates that its sales of all finished steel products during the past six weeks would have been greater by 200,000 tons if its capacity had been equal to the demand. Automobile production is the heaviest in history and manufacturers now look for a continuance of this high rate of activity throughout the year. The reinforcing bar distributors, the railroads, and railroad car builders also are taking large quantities of bars, as are a wide variety of miscellaneous users. Farm implement manufacturers continue to report improved trade, some of them having entirely liquidated their stocks of finished machinery. The demand for bar iron, which long lagged behind that for soft steel bars, is now brisk and mills are running to the limit of their capacity, the present labor shortage considered. Rail carbon steel bars have advanced to 1.70c. Chicago. The two Chicago Heights mills are now on double turn with three months work ahead.

Mill prices are: Mild steel bars, 1.75c. to 1.85c., Chicago; common bar iron, 1.75c. to 1.80c., Chicago; rail carbon, 1.70c. mill or Chicago.

Jobbers quote 2.48c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.40c. for rounds and 3.90c. for flats, squares and hexagons. Jobbers quote hard and medium deformed steel bars at 2.38c. base. Hoops, 3.48c. Bands, 3.23c.

Bolt and Nuts.—Third quarter contracts are being closed freely at the new discounts and buyers are specifying heavily against their second quarter contracts to get the benefit of the old discounts. Large quantities of bolts and nuts are being taken by the automobile manufacturers, some of whom wish to cover not only for their third quarter requirements but for the rest of the year. Jobbers, railroads and carbuilders are also buying heavily. A number of implement makers are now specifying liberally under second quarter contracts and are also covering for their third quarter needs. The ruling discounts are the same as those published on page 1859, except that they are on a Chicago base.

Jobbers quote structural rivets, 3.10c.; boiler rivets, 3.20c.; machine bolts up to ⅞ x 4 in., 50, 10 and 10 per cent off; larger sizes, 50 and 10 off; carriage bolts up to ¾ x 6 in., 50 and 5 off; larger sizes, 45 off; hot pressed nuts, squares and hexagon tapped, $3.25 off; blank nuts, $3.50 off; coach or lag screws, gimlet points square heads, 60 per cent off; quantity extras are unchanged.

Wire Products.—The demand for wire and nails is insistent. Jobbers apparently have no accumulation, as they are still pounding for shipments. Under the usual custom of selling 60 days ahead to jobbers and from 60 to 90 days ahead to manufacturing users, mills are booked practically to the limit and are not anxious for additional business. Notwithstanding the fact that the season for barbed wire and staples is over, orders and specifications for these commodities are still being received. For mill prices see finished iron and steel f.o.b. Pittsburgh. Page 1859.

We quote warehouse prices f.o.b. Chicago: No. 9 and heavier black annealed wire, $3.10 per 100 lb.; No. 9 and heavier bright basic wire, $3.25 per 100 lb.; common wire nails, $3.25 per 100 lb.; cement coated nails, $2.75 per keg.

Sheets.—The dearth of sheets is indicated by the fact that inquiries are being received from New York State and other points usually served by Eastern mills. The export business which has been presumably dead for 30 days has suddenly sprung to life and a number of appeals for galvanized sheets have been received from foreign distributors with customers in Mexico, Central America, the British West Indies and Porto Rico. The local independent is heavily booked and is centering its attention on taking care of its regular trade.

Mill quotations are 3.15c. to 3.30c. for No. 28 black, 2.40c. to 2.50c. for No. 10 blue annealed and 4.15c. to 4.30c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 38c. per 100 lb.

Jobbers quote blue annealed, 3.63c.; black, 4.45c.; galvanized, 5.45c.

Structural Material.—That construction activity is unabated is indicated by the fact that building permits in Chicago in May with a total involved cost of over $27,000,000, broke all previous records and permits issued in the first 15 days of June were even heavier, aggregating $15,000,000 in estimated cost. Local mills continue to book business for indefinite shipment and for earlier delivery buyers must look to Eastern mills or to warehouses. Fabricators are busy. The largest new letting covers 2300 tons, which will be supplied by the Kansas City Structural Steel Co. for smelter buildings at Superior, Ariz., to be constructed by the Magma Copper Co.

The mill quotation on plain material is 1.75c. to 1.85c., Chicago. Jobbers quote 2.58c. for plain material out of warehouse.

Plates.—Mills continue to experience difficulty in supplying the steel required by car builders. Notwithstanding the fact that 75,000 freight cars have been ordered thus far this year, 16,000 additional are now pending and a single large trunk line is known to be negotiating privately for 30,000 cars.

The mill quotation is 1.75c. to 1.85c., Chicago. Jobbers quote 2.58c. for plates out of stock.

Cast-Iron Pipe.—Redford, Michigan, has let 1100 tons to the United States Cast Iron Pipe & Foundry Co. and 500 tons to the American Cast Iron Pipe Co. The United States company will also supply 600 tons for Chicago and 500 tons for Downers Grove, Ill. Columbus, Ohio, has let 500 tons to James B. Clow & Son and 100 tons to the American company and today takes bids on 500 tons additional. Omaha is expected to come into the market for a large tonnage in a month or two. Pipe shops are well booked and prices are strong.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $50.10 to $50.60; 6-in. and above, $46.10 to $46.60; class A and gas pipe, $3 extra.

Rails and Track Supplies.—The Illinois Central has placed 20,000 tons of standard section rails with the Gary mills on which it wants July to October delivery. This is the second large tonnage bought by this road this year, the first having been rolled and delivered. Orders for track fastenings continue to pour in faster than the mills can take care of them. Small railroad and boat spikes have advanced to a minimum of 2.50c., base Pittsburgh.

Standard Bessemer and open-hearth rails, $40; light rails rolled from new steel, 1.75c., f.o.b. makers' mills.

Standard railroad spikes, 2.12c. to 2.25c., Pittsburgh; track bolts with square nuts, 3.12c. to 3.25c., Pittsburgh; tie plates, steel and iron, 1.85c., f.o.b. mill; angle bars, 2.40c., f.o.b. mill.

Coke.—Local by-product foundry coke will be advanced 50c. a ton to $11.25 delivered Chicago switching district, effective July 1.

Fluorspar.—A local steel works has closed for 1000 tons of gravel fluorspar. The market ranges from $16 to $17.50 mines, according to the guarantee.

Old Material.—Buying of some grades is more liberal than for some weeks, but the attitude of users is still a cautious one. The uncertainties of the fuel situation and the threatened railroad strike are causing even the shrewdest consumers to follow a most conservative policy in replenishing their stocks. Fair-sized orders have been placed, however, and these, no doubt, cover early needs. A steel mill has closed for a round tonnage of heavy melting for which it paid a maximum of $15.25, per gross ton delivered. Another steel works bought about 1000 tons of specialties at advancing prices and another local interest has placed orders for low phosphorus grades. A rolling mill has placed a number of orders for iron mill grades and there has been fairly steady buying of cupola scrap in small tonnages. Prices are generally stronger not only on account of consumptive buying, but also because of speculative activity on the part of dealers. In this connection, it is notable that railroad scrap is bringing out attractive bids. Ordinarily the roads give the buyer at least 30 days and sometimes longer in which to accept delivery of material. A few grades, particularly machine shop turnings, are now moving East to the Valleys because the delivered price there is sufficiently high to cover the Chicago price and the freight. Railroad offerings include the Illinois Central, 7000 tons; the Burlington, 4500 tons; the Pennsylvania, Northwestern region, 2500 tons; and the New York Central, a blind list.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Iron rails	$17.50 to $18.00
Cast iron car wheels	18.25 to 18.75
Relaying rails	22.50 to 27.50
Rolled or forged steel car wheels	17.00 to 17.50
Steel rails, rerolling	15.75 to 16.25
Steel rails, less than 3 ft	16.50 to 17.00
Heavy melting steel	14.75 to 15.25
Frogs, switches and guards cut apart	14.75 to 15.25
Shoveling steel	14.25 to 14.75
Drop forge flashings	9.75 to 10.25
Hydraulic compressed sheet	12.00 to 12.50
Axle turnings	12.00 to 12.50

Per Net Ton

Iron angles and splice bars	16.00 to 16.50
Steel angle bars	14.00 to 14.50
Iron arch bars and transoms	16.75 to 17.25
Iron car axles	21.50 to 22.00
Steel car axles	14.50 to 15.00
No. 1 busheling	11.25 to 11.50
No. 2 busheling	6.75 to 7.25
Cut forge	12.75 to 13.25
Pipes and flues	9.50 to 10.00
No. 1 railroad wrought	13.25 to 13.75
No. 2 railroad wrought	13.00 to 13.50
Steel knuckles and couplers	14.50 to 15.00
Coil springs	15.25 to 15.75
No. 1 machinery cast	16.50 to 17.00
No. 1 railroad cast	15.50 to 16.00
Low phos. punchings	14.00 to 14.50
Locomotive tires, smooth	12.50 to 13.00
Machine shop turnings	7.75 to 8.25
Cast borings	10.75 to 11.25
Stove plate	14.50 to 15.00
Grate bars	13.00 to 13.50
Brake shoes	13.00 to 13.50
Railroad malleable	15.00 to 15.50
Agricultural malleable	15.00 to 15.50

New York

Coal Situation Checking Sales of Steel—No Large Sales of Pig Iron

NEW YORK, June 27.

Pig Iron.—Although there have been no large sales of pig iron, purchases ranging from a few car loads to 400 to 500 tons have been rather numerous, and prices are being maintained. Naturally shipments have been deferred to a large extent on account of reduction in freight rates July 1, but in a few cases buyers have asked sellers to hasten shipments. Among the inquiries is one for several thousand tons from a New England company. The details have not been made public. One of the very interesting features of the present situation is the inability of charcoal blast furnaces to increase their output owing to the shortage of wood-choppers. There seems to be no prospect that the production of this grade of iron will be increased. Charcoal iron prices have been marked up $2 during the past week and are now quoted on a basis of $28.50, Michigan furnace. Of the 5000 tons of No. 3 Scotch iron referred to in this report last week, 1000 tons has arrived in Boston and the remainder will come along later. Southern iron can be had in this market on a basis of $18.50 for No. 2 plain, Birmingham, and it is believed possible to buy at $18. In eastern Pennsylvania, $24.50 is the minimum and $25 has been paid. The Buffalo minimum seems to be $23.50. Operations of the barge canal have been restricted to a considerable extent by high water.

We quote delivered in the New York district as follows, having added to furnace prices $2.52 freight from eastern Pennsylvania, $5.46 from Buffalo and $6.16 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$28.52 to $29.02
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	27.52 to 28.02
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	27.02 to 27.52
Buffalo, sil. 1.75 to 2.25	28.96 to 29.46
No. 2 Virginia, sil. 1.75 to 2.25	29.16

Ferroalloys.—There has been large selling of ferromanganese within the past week, variously estimated at from 10,000 to 15,000 tons. Practically all of this business went to agents of British makers, being fairly evenly divided. The business came from most of the steel makers in the Pittsburgh and Chicago districts. British ferromanganese is now fairly well sold up until Sept. 1, although there is a little available for July delivery. Domestic makers are also sold up through July and August. The price continues at $67.50, seaboard, for both imported and domestic. A few hundred tons of spiegeleisen has been sold within the week at $36, furnace.

Ferroalloys

Ferromanganese, domestic, seaboard, per ton	$67.50
Ferromanganese, British, seaboard, per ton	$67.50
Spiegeleisen, 20 per cent	$36.00
Ferrosilicon, 50 per cent, delivered, per ton	$55.00 to $60.00
Ferrotungsten, per lb. of contained metal	40c. to 50c.
Ferrochromium, 6 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered	12c. to 14c.
Ferrovanadium, per lb. of contained vanadium	$3.00 to $3.50
Ferrocarbontitanium, 15 to 18 per cent, 1 ton to carloads, per ton	$200.00

Ores

Manganese ore, foreign, per unit, seaboard	25c. to 26c.
Tungsten ore, per unit, in 60 per cent concentrates, nominal	$3.00 up
Chrome ore, basis 48 per cent Cr_2O_3, crude, per unit, Atlantic seaboard	40c. to 45c.
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	40c. to 45c.

Finished Iron and Steel.—Undeniably the feature of the week is the pronounced hesitation of the mills to accept orders owing to the uncertainty of the coal situation. The attitude is to take care of regular customers where pressure is brought to do so, but generally the producer is limiting as far as possible the volume of the business accepted, as it may involve high fuel costs. Though some of the mills have still sixty days' coal supply, it is necessary to contract for the continuing period. In a word, the situation is one of firm and advancing prices in the face of a small volume of buying; the fact remains that mills, generally, could fill up well if they chose to accept the buyer's idea of prices. With rare exceptions, relatively prompt delivery can be obtained on the heavy tonnage products only at 1.70c. and 1.75c., Pittsburgh basis. The exception is that attractive lots of plates have lately been closed with an Eastern mill at a 1.60c. basis. An inquiry for several hundred tons of steel sheet piling was received in New York from Seattle, from Harry F. Reynolds, purchasing department Contractors Machinery & Storage Co., Seattle, with a preference expressed for good second-hand material.

We quote for mill shipments, New York, as follows: Soft steel bars and structural shapes, 2.08c.; bar iron, 1.98c., and steel plates, 1.98c. to 2.08c. On export shipments the freight rate from Pittsburgh to New York is 28.5c. per 100 lb. and the domestic rate is 38c. until July 1, when it becomes 34c.

Warehouse Business.—Improved conditions continue and with most warehouses June is expected to figure up as a better month than May. While the present warehouse quotations are based upon a 1.60c. per lb. Pittsburgh, mill price, on bars it is claimed that 1.70c. and higher is really the mill quotation to-day and an increase in warehouse prices would be justified. It is said that the average cost of selling from warehouse in various warehouse centers is about 15 per cent, which, it is claimed, is a low figure for the New York district, where high wages prevail and long hauls are made on deliveries. Black and galvanized sheets are weaker, the past week having witnessed a few sales at as low as 4c. and 5c. per lb. base on black and galvanized. In the main, however, the established price schedule is being maintained. Wrought iron and steel pipe sellers are now practically back to the discount schedule that has been quoted for many months but not strictly adhered to, and after July 1, it is believed that there will be little weakness evident. Brass and copper warehouses report slightly less activity, the wire screening season having drawn to a close and purchasing by radio equipment manufacturers still being light. We quote prices on page 1874.

High Speed Steel.—The market continues dull and prices weak. The current quotation is about 75c. per lb. for 18 per cent tungsten high speed with special brands of some companies selling up to 95c. per lb.

Old Material.—The market has quieted down greatly. On the whole, cast iron is far more active than steel. There has been some small purchasing of stove plate, which is slightly firmer and quotable at $10 to $10.50 per ton. Specification pipe is off a little, $8 to $8.50 being about the present market. Mixed borings and turnings are inactive, the two heavy purchasers recently, Weirton Steel Co. and La Belle Iron Works, no longer being in the market. In recent buying of material, delivery after July 1 has usually been specified to obtain the lower freight rates.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$9.50 to $10.00
Steel rails, short lengths, or equivalent	11.00 to 11.50
Rerolling rails	11.00 to 11.50
Relaying rails, nominal	27.00 to 28.00
Steel car axles	16.00 to 17.00
Iron car axles	22.00 to 23.00
No. 1 railroad wrought	12.50 to 13.00
Wrought iron track	11.00 to 11.50
Forge fire	8.00 to 8.50
No. 1 yard wrought, long	10.50 to 11.00
Cast borings (clean)	9.00 to 10.00
Machine-shop turnings	9.00 to 10.00
Mixed borings and turnings	9.00 to 10.00
Iron and steel pipe (1 in. diam., not under 2 ft. long)	8.00 to 8.50
Stove plate	10.00 to 10.50
Locomotive grate bars	11.50 to 12.00
Malleable cast (railroad)	10.00 to 10.50
Cast-iron car wheels	13.00 to 13.50

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast	$18.00 to $19.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	16.50 to 17.00
No. 1 heavy cast, not cupola size	13.00 to 13.50
No. 2 cast (radiators, cast boilers, etc.)	12.00 to 12.50

Cast-Iron Pipe.—Makers are all well filled and behind on deliveries. Private purchasing is still extremely heavy but municipal lettings are not as numerous as a few weeks ago. The Board of Contract and Supply, Yonkers, N. Y., will open bids July 3 on 2200 tons of 24-in. and 30-in. cast-iron pipe. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $50.80; 4-in. and 5-in., $55.50; 3-in., $65.80, with $4 additional for Class A and gas pipe.

Coke.—The coke situation is becoming more serious and it is extremely difficult to get any foundry coke, even at $8.50. Some dealers, disgusted on account of the inferior quality of the coke, are not trying to sell. The price of by-product coke has been advanced 50c. and is now sold at $10 seaboard to regular customers only.

Philadelphia

All of the Markets Are Quieter But Prices Are Firm With Upward Tendency

PHILADELPHIA, June 27.

Apparently the menace of the coal situation is becoming a more serious factor in the minds of consumers. Some of them see the end of their present coal supply and do not desire to commit themselves further for other raw materials until there is a prospect of an ending of the strike. The country's available bituminous coal supply, it is estimated, is sufficient to last not longer than 10 weeks. Steel mill and blast furnace operators likewise view the situation with more concern than has been exhibited at any time since the beginning of the strike, and there is less pressure to sell, particularly among the pig iron producers. In spite of the falling off in demand, the price situation continues strong as regards both pig iron and steel and whatever changes have taken place within the week have been toward higher levels.

Ore.—The first shipment of a purchase of El Capitan iron ore from Tunis, Africa, arrived last week for the Alan Wood Iron & Steel Co., Philadelphia, which has bought altogether about 75,000 tons of this ore for use during the next few months. This company has also purchased about the same quantity of Swedish ore, a part of which has arrived. Both African and Swedish ore can be laid down at Philadelphia for quite a bit less than Lake Superior ore. Last week's arrival of African ore was the first since before the war. Its iron content ranges from 55 to 58 per cent and it is low in phosphorus, about 0.04 per cent. The sale of African ore was negotiated by Watt & Co., Bellevue Court Building, Philadelphia.

Pig Iron.—The demand for pig iron is light, which is not displeasing to producers in this district, who have considerable business on their books and are content to go along without seeking more orders until there is a favorable turn in the coal and coke situation. So far the furnaces in blast have managed somehow to keep going, but it now appears that the Warwick furnace will be obliged to go out of blast about July 1. Its coke supply has been furnished by the Rainey-Wood Coke Co., which will now require the coke for the Alan Wood Iron & Steel Co., which will put a third furnace in blast. Pig iron prices continue their upward trend, all grades of foundry iron being about 50c. a ton higher than a week ago. There has been no important inquiry for foundry iron, but the American Bridge Co., Pencoyd, has been seeking 12,000 tons of basic for shipment in August and September. Quotations are said to have been about $25, furnace, and the intimation is that the company would find it cheaper to bring in iron from some of the Steel Corporation furnaces in the South or the Pittsburgh district. The Replogle Steel Co., which has been a leading seller in this market from its furnace at Wharton, N. J., has advanced prices 50c. a ton, now quoting $25 for No. 2 plain, $26 for No. 2X and $27 for No. 1X, to which is added a freight rate of $1.82 to Philadelphia. This furnace has a substantial volume of business on its books and is less active in seeking new orders. Prices from furnaces nearer to Philadelphia vary from $26 to $26.50 for No. 2 plain, $26.50 to $27.50 for No. 2X, while No. 1X is quoted as high as $29, furnace. Sales have been made at these prices. Malleable iron has been sold at $26.50, furnace. The quotation on gray forge iron, $25 to $26, is nominal as no sales have been made recently, but this grade has been quoted by one maker at $30, furnace. Southern gray forge iron has been offered for delivery in this district at about $27.50, delivered. A steamer brought 800 tons of No. 3 Scotch iron to Philadelphia last week and this is being offered by a local office at $26.50, Philadelphia. Another lot of about the same tonnage is due to arrive here shortly and 900 tons will arrive at Baltimore within a week or two. Early in July a shipment of 5000 tons of No. 3 Middlesborough iron will arrive and this is being offered at $25, Philadelphia. French iron is said to be the cheapest foreign iron now available. It can be laid down at about $22, Philadelphia. Some of it is being offered for sale at $24.50, Philadelphia. Warm blast charcoal iron from Wells, Mich., has been advanced to $27.50, furnace. There is a freight rate of $3.64 per ton to Buffalo, and the rate from that point to ultimate destination is added. The Robesonia furnace went in blast on June 20 on copper bearing low phosphorus iron.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 84 cents to $1.54 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$26.82 to $27.34
East. Pa. No. 2X, 2.25 to 2.75	27.82 to 28.34
East. Pa. No. 1X	28.82 to 29.84
Virginia No. 2 plain, 1.75 to 2.25 sil.	27.74 to 28.24
Virginia No. 2X, 2.25 to 2.75 sil.	28.24 to 28.74
Basic delivery eastern Pa.	25.00 to 25.50
Gray forge	25.00 to 26.00
Malleable	27.50 to 28.00
Standard low phos. (f.o.b. furnace)	30.00
Copper bearing low phos. (f.o.b. furnace)	30.00

Ferroalloys.—Ferromanganese has been active during the past week. Probably 10,000 tons or more has been sold to steel companies in the Pittsburgh and Chicago districts, very little going to steel plants in the East. British makers are now pretty well sold up through July and August and the domestic makers are in about the same position. The price continues at $67.50, seaboard, for both imported and domestic. Spiegeleisen remains at $36, furnace.

Semi-Finished Steel.—Sales of 1500 tons or more of open-hearth rerolling billets have been made by one company at $35, Pittsburgh; also a few hundred tons of forging billets at $38. Prices on the latter range up to $40, Pittsburgh.

Plates.—The Lukens Steel Co. has announced an advance to 1.80c., Pittsburgh, on plates; the Bethlehem Steel Co. has advanced its price $1 a ton to 1.75c., while one or two other independents are asking 1.80c. in some instances. Plates are still being sold as low as 1.60c., Pittsburgh, for Eastern trade, and it is easier to obtain 1.70c., Pittsburgh, in the Pittsburgh and Cleveland districts than it is in the East. No business of importance has been closed within the week, but there is a fairly steady demand. We quote sheared plates, ¼ in. and heavier, at 1.60c. to 1.80c., Pittsburgh.

Structural Material.—An advance on plain material to 1.75c., Pittsburgh, has been announced by the Bethlehem Steel Co. Other independent makers are quoting from 1.60c. to 1.80c., Pittsburgh, but the latter price is merely an asking price so far, not having been established by any sales of importance. The Girard Trust Co., Philadelphia, will build an addition requiring about 1000 tons of steel. We quote plain material from 1.60c. to 1.80c., Pittsburgh.

Bars.—Steel bars are firm at 1.70c., Pittsburgh, and apparently are not to be obtained from any source for early delivery at any lower figure. The Midvale Steel & Ordnance Co. has advanced its price on steel bars to 1.80c., Pittsburgh. Business continues in fair volume, though the rate of buying is not keeping pace with that of several weeks ago. Bar iron is still quoted by Eastern makers at 1.60c., Pittsburgh, for carload lots and 1.70c. for less carloads.

Sheets.—The Alan Wood Iron & Steel Co. has announced that its price for blue annealed sheets for third quarter is 2.60c., Pittsburgh. The company states that the advance is due to high costs of production, which makes it impossible to sell at the 2.40c. price quoted by the American Sheet & Tin Plate Co. Quotations on sheets now vary from 2.40c. to 2.60c. for blue annealed, 3.15c. to 3.40c. for black and 4.15c. to 4.40c. for galvanized, all base Pittsburgh.

Warehouse Business.—Demand for steel out of stock has shown no gain in the past week or two, but is main-

tained at about the rate of preceding weeks. We quote for Philadelphia delivery as follows:

Soft steel bars and small shapes, 2.56c.; iron bars (except bands), 2.56c.; round edge iron, 2.75c.; round edge steel, iron finish, 1½ x ½ in., 2.75c.; round edge steel planished, 3.50c.; tank steel plates, ¼-in. and heavier, 2.66c.; tank steel plates, 3/16-in., 2.85c.; blue annealed steel sheets, No. 10 gage, 3.40c.; black sheets, No. 28 gage, 4.25c.; galvanized sheets, No. 28 gage, 5.25c.; square twisted and deformed steel bars, 2.65c.; structural shapes, 2.66c.; diamond pattern plates, ¼-in., 4.35c.; 3/16-in., 4.50c.; spring steel, 3.50c.; round cold-rolled steel, 3.20c.; squares and hexagons, cold-rolled steel, 3.70c.; steel hoops, No. 13 gage and lighter, 3.35c.; steel bands, No. 12 gage to 3/16-in., inclusive, 3.21c.; iron bands, 3.90c.; rails, 2.36c.; tool steel, 8c.; Norway iron, 5.50c.; toe calk steel, 4.50c.; tire steel, 2.65c.; planished tire steel, 3.40c.

Old Material.—The scrap market is flat but prices stay up surprisingly well in view of the general apathy of buyers. This is due largely to the belief of scrap dealers that the lull is temporary and that mills and foundries will be back in the market within a few weeks. The scarcity of cast iron borings was evidenced on an inquiry for 1000 tons from a Pittsburgh district steel company, which offered $16.50, delivered. This would be equivalent to a delivered price of more than $15 for eastern Pennsylvania. At least two local brokers who had this inquiry were unable to obtain borings at any price. One broker who has been in the business for more than 20 years says this is the first time within his experience that he could not buy borings. Blast furnaces have used large quantities lately and they have not been produced at machine shops in normal volume. We quote various grades of old material for delivery at consumers' works in this district:

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$15.00 to $15.50
Scrap rails	15.00 to 15.50
Steel rails, rerolling	17.00 to 17.50
No. 1 low phos., heavy 0.04 and under	22.00 to 24.00
Cast iron car wheels	17.50 to 18.50
No. 1 railroad wrought	17.00 to 17.50
No. 1 yard wrought	15.00 to 15.50
No. 1 forge fire	13.00 to 13.50
Bundled sheets (for steel works)	13.50 to 14.00
No. 1 busheling	15.00 to 15.50
No. 2 busheling	12.00 to 13.00
Turnings (short shoveling grade for blast furnace use)	13.50 to 14.00
Mixed borings and turnings (for blast furnace use)	13.50 to 14.00
Machine-shop turnings (for steel works use)	13.50 to 14.00
Machine-shop turnings (for rolling mill use)	14.00 to 14.50
Heavy axle turnings (or equivalent)	13.50 to 14.00
Cast borings (for steel works and rolling mills)	14.00 to 14.50
Cast borings (for chemical plants)	16.50 to 17.50
No. 1 cast	19.00 to 19.50
Railroad grate bars	14.50 to 15.00
Stove plate (for steel plant use)	15.00 to 15.50
Railroad malleable	15.00 to 15.50
Wrought iron and soft steel pipes and tubes (new specifications)	14.00 to 14.50
Shafting	20.00 to 20.50

Buffalo

BUFFALO, June 26.

Pig Iron.—Inquiry and sales have been light and the price situation is firm. The ruling quotation is $24 base. A furnace which has been taking business in a conservative way for several weeks announces its withdrawal and its agents state the entire output is being shipped. The final sales before withdrawal were made at $25 base and an offer of $24.50 on malleable was refused. The fuel situation is more serious, if anything, but in the face of this a Buffalo producer will blow in another furnace July 1. No big tonnages are being inquired for and in the total sales of 6000 tons by one producer the largest single lot was for 1000 tons.

We quote f.o.b. per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil	$25.00
No. 2X foundry, 2.25 to 2.75 sil	24.50
No. 2 plain, 1.75 to 2.25 sil	24.00
Basic	24.00
Malleable	24.50
Lake Superior charcoal	29.14

Finished Iron and Steel.—Virtually every Buffalo seller is turning down business, with the result that buyers seeking immediate deliveries are going to warehouses. All mill schedules are becoming more extended and the general situation now is that deliveries are not promised under three months. The minimum price on bars is 1.70c., and while it is understood the Steel Corporation has not announced this price, it is stated that 1.70c. has been quoted in a number of instances by its subsidiaries. All sellers are exercising caution in committing themselves and inquiry in all lines is brisk. One agency is taking occasional bar orders and orders for black sheets freely. From 2.40c. to 2.50c. is quoted on bands. Bolt and nut demand is good and in general prices are satisfactory and business is on a profitable basis. Structural shapes are scarce and fabricators are having difficulty in obtaining deliveries. A number of structural projects planned for this year may go over to 1923. The Lackawanna Steel Co. is understood to be quoting 1.80c. on bars, 1.90c. on shapes and 2c. on plates.

Warehouse Business.—Sheets are in good demand and because of the inability of mills to supply structural shapes, considerable business in this product has reached warehouses. The whole market is well balanced. Car shops have bought plates and shapes at warehouses because of uncertain mill schedules and shafting has been called for in greater volume than recently. Warehouse materials which have been slow have been moving in a more satisfactory way.

We quote warehouse prices, f.o.b. Buffalo, as follows: Structural shapes, 2.65c.; plates, 2.65c.; soft steel bars, 2.55c.; hoops, 3.30c.; bands, 3.15c.; blue annealed sheets, No. 10, 3.55c.; galvanized steel sheets, No. 28, 5.40c.; black sheets, No. 28, 4.40c.; cold-rolled strip steel, 6.05c.; cold-rolled round shafting, 3.35c.

Old Material.—Mills are not anxious to buy, though they are not understood to be out of the market. In heavy melting steel, inspection is rigid and rejections have been frequent. Sales have been light and probably the largest individual tonnage was less than 500 tons. Railroad lists for the New York Central and Erie railroads close July 3.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	$16.75 to $17.00
Low phos., 0.04 and under	18.00 to 19.00
No. 1 railroad wrought	16.00 to 16.50
Car wheels	17.00 to 18.00
Machine shop turnings	10.50 to 11.00
Cast iron borings	12.50 to 13.00
Heavy axle turnings	14.00 to 14.50
Grate bars	14.00 to 14.50
No. 1 busheling	15.00 to 15.50
Stove plate	15.00 to 15.50
Bundled sheet stampings	11.50 to 12.00
No. 1 machinery cast	18.00 to 18.50
Hydraulic compressed	15.00 to 15.50
Railroad malleable	17.00 to 17.50

Birmingham

BIRMINGHAM, ALA., June 27.

Pig Iron.—At the close of the week ending June 24 it looked very much as if selling on a base of $20 would be without exception in the Birmingham iron market in the immediate future. The leading pipe maker has booked from 15,000 to 20,000 tons for the remainder of the third quarter. The maker open for fourth quarter business booked 1200 tons and 300 tons for St. Louis, several car loads for Cincinnati and car lots to lots of 200 tons in Southern territory at the uniform base of $20. Another on that base for third and fourth quarter also made bookings of from 100-ton lots to lots running into the thousands at $20. One of the largest makers has nothing under $20. The one maker quoting $18.50 is credited with recent bookings of 2000 tons to an Indiana stove plant, 400 tons to St. Louis, 1000 tons to Indianapolis, 1000 tons to a northern Ohio maker and several sales in the East. All makers are now believed to be sold to near capacity for fourth quarter and all levels under $20 are expected to disappear this week. The lowest offerings of foreign iron on the Pacific Coast just about approximate $20 Birmingham and freight via canal. Very few requests for delays on account of rate reductions have been received. Pipe shops must come into market for fourth quarter for large tonnages. Makers believe purchasing by the leading pipe interest will have a tendency to expedite the entrance of smaller interests. The Tennessee company's first cargo of Brazilian ore is due for early arrival at Mobile and means resumption at another blast furnace. Charcoal iron is strong and sales have been made at $32 base, Birmingham.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	$18.50 to $20.00
Basic	18.50 to 19.00
Charcoal, warm blast	30.00 to 32.00

Finishing Mills.—All steel works are at or near 100 per cent. Martinique took a lot of steel hoops this week out of Mobile. The Fairfield plate mill of the Tennessee company is operating this week while the Bessemer plate mill undergoes a rest. Wire drawing mills report continuous activity in wire fencing, which is unusual for this time of the year. Sheets and pipe are in strong demand. The Tennessee company has begun excavations for its 10 and 12-in. merchant bar mill at Fairfield.

Cast Iron Pipe.—The leading interest has booked numbers of orders for South and Southwestern delivery. Hendersonville, N. C., has taken 16 miles of 16-in. and Childress, Tex., 612 miles of 14-in. Dallas will open bids June 30 for 1000 tons and Morgantown, N. C., is in the market for 12 miles of 12-in. pipe. The base remains at $37. Deliveries are not promised under 30 to 75 days. Sanitary pipe is at $55 for spot and nearby delivery on new business.

Coal and Coke.—The coal base for extra business due to strike is about $2.25, Pratt seam. Production has reached 330,000 tons a week, which is more than normal. Sales of 50,000 to 60,000 tons a week to distressed territory are made. St. Louis is largest taker. Coke is also going to Chicago. Spot coke brings $6 in some instances with $5.50 the average.

Old Material.—Old material is much stronger. No. 1 steel brought the quoted prices last week from the largest taker, who paid $12 for 7500 tons. An Atlanta steel works paid as high as $13 and $14. Small takers have paid $14 to $14.50. Business is much brisker.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	$13.00 to $15.00
No. 1 steel	12.00 to 14.00
No. 1 cast	14.00 to 15.00
Car wheels	13.00 to 14.00
Tramcar wheels	12.00 to 13.00
Stove plate	12.00 to 13.00
Cast iron borings	6.00 to 7.00
Machine shop turnings	4.00 to 5.00

Boston

BOSTON, June 27.

Pig Iron.—The pig iron situation in this territory apparently has settled down to a period of waiting for initiative. Buffalo furnace interests which a week or ten days ago offered iron at concessions have withdrawn from the market so far as can be learned after having brought their prices more in line with Buffalo furnaces regularly represented in New England, which are quoting on a $25 furnace base. Foundries maintain Buffalo iron is still available at around $23 to $23.50 furnace base. Additional bookings of Pennsylvania iron having a $6.58 freight at $22 furnace base are reported, but the tonnage involved is small. One Alabama furnace sold 2600 tons, mostly silicon 2.25 to 2.75, during the past week at $18.50 and $19 furnace base, the largest individual buyer being a central Massachusetts textile machinery maker who also bought 400 tons silicon 4.00 to 5.00, making his aggregate purchases 1000 tons. Scattering car lots of eastern Pennsylvania spot iron, mostly silicon 2.75 to 3.25, are noted at $30 and $31 furnace base. Northern charcoal iron, heretofore quoted here at $31, is now $32.14. The Canadian Ingersoll-Rand Co. and another Canadian interest are inquiring on small tonnages. Interest in English, Scotch and French irons is of a presumptive nature.

We quote delivered at common New England points as follows, having added to furnace prices $4.06 freight from eastern Pennsylvania, $5.46 from Buffalo and $10.66 from Alabama:

East. Penn., sil. 2.25 to 2.75	$28.56 to $29.56
East. Penn., sil. 1.75 to 2.25	28.06 to 29.06
Buffalo, sil. 2.25 to 2.75	28.96 to 29.96
Buffalo, sil. 1.75 to 2.25	28.46 to 29.46
Alabama, sil. 2.25 to 2.75	29.66 to 30.16
Alabama, sil. 1.75 to 2.25	29.16 to 29.66

Warehouse Business.—Warehouse prices on bolts and nuts have been advanced 10 per cent, making hot-punched machine bolts 50 per cent and cold-punched 45 per cent discount, and semi-finished nuts 9/16 in. and smaller 75 per cent and ⅝ in. and larger 65 and 10 per cent discount. Mills, especially New England, are well sold ahead, and warehouses have moderate stocks. Warehouse prices on iron and steel are reported strong, while business is looking up. Sheets are beginning to move out of local stocks in volume once more. Common talk is that structural and boiler type rivets will shortly be advanced. The market for washers is firmer in sympathy with bolts and nuts. Warehouse prices on iron and steel follow:

Jobbers quote: Soft steel bars, $2.60½ per 100 lb. base; flats, $3.25½; concrete bars, $2.75 to $2.88; structural steel, $2.60½ to $2.70½; tire steel, $4 to $4.35; open-hearth spring steel, $4.50 to $6; crucible spring steel, $11.50; steel bands, $3.50; hoop steel, $4; cold rolled steel, $3.30 to $3.80; refined iron, $2.60½; best refined iron, $4.25; Wayne iron, $5.50; Norway iron, $6 to $6.50; plates, $2.70½ to $2.87½; No. 10 blue annealed sheets, $3.40½ to $3.63 per 100 lb. base; No. 28 black sheets, $4.90; No. 28 galvanized sheets, $5.90.

Finished Iron and Steel.—Structural steel bookings are much less than they were a month ago, but some business is being put through each day. Recent sales aggregate 6000 tons. Mill representatives report a fair demand for bars and sheets. Plate business is confined to car lots at 1.60c. to 1.75c. Pittsburgh base. Deliveries on everything but structural steel are backward.

Coke.—New England producers of by-product foundry coke have advanced spot fuel from $11.50 to $13 a ton delivered where the local freight does not exceed $3.40 a ton, making an extreme advance of $2.85 from the low price of the year established early in February. The producers also advanced contract fuel from $11 to $12 delivered. The Providence Gas Co. then withdrew all contract prices for the rest of the year. The New England Coal & Coke Co. is quoting $10 ovens for foundry coke to be shipped outside New England, an advance of $1 a ton. The price situation is very strong on the new basis, and indications strongly point to a further advance in contract fuel on July 1, and possibly in spot coke as well. An increase in bookings of contract foundry coke for last half shipment during the past week indicates uneasiness among consumers. Coke makers, however, report little, if any, increase in daily shipments to New England foundries, which suggests no greater activity in this field. Buffalo pig iron interests sounded out this market since last reports on shipments of 100 tons per day, but there was a spread of $4 between this and the Buffalo district fuel market.

Old Material.—Few new contracts for old material were made in this territory the past week, consumer, producer and broker all marking time until the freight rate situation has cleaned up. There has, however, been considerable buying by brokers against contracts placed previously by Pennsylvania mills at unchanged prices. Mixed borings and turnings containing 20 per cent bushings have been taken on a basis of $8.50 shipping point, while clear stock fetched 50c. a ton more. Offers of $10 shipping point for chemical borings have failed to interest holders, but car lots were sold at $11. Cotton ties, for scrap purposes, have changed hands at $7.10, and for splicing use at $8. Inquiries for heavy city horseshoes disclose a shortage. Brokers are still unable to do much business with New England foundries on machinery cast, melters being able to supply their wants from local yards from hand sorted stocks. One consumer is still in the market for stove plate at $13.75 delivered at a consuming point which has an average freight of $2.20 to $2.50, but is securing comparatively little material.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$19.00 to $20.00
No. 2 machinery cast	17.00 to 18.00
Stove plate	13.50 to 14.00
Railroad malleable	15.00 to 15.50
Street car wheels	18.00 to 19.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$10.00 to $10.50
No. 1 railroad wrought	11.50 to 12.00
No. 1 yard wrought	10.00 to 10.50
Wrought pipe (1 in. in diam., over 2 ft. long)	8.00 to 8.50
Machine shop turnings	7.75 to 8.00
Cast iron borings, rolling mill	8.50 to 9.00
Cast iron borings, chemical	10.50 to 11.00
Blast furnace borings and turnings	7.75 to 8.00
Forged scrap and bundled skeleton	8.00 to 8.50
Street car axles and shafting	14.50 to 15.00
Rerolling rails	11.00 to 11.50

St. Louis

ST. LOUIS, June 27.

Pig Iron.—The market for pig iron rules stronger, with Northern iron higher at $23.50, Chicago, for third quarter delivery and $24 for spot. The demand is heavier, although individual sales of heavy tonnage were recorded during the week, sales being from carloads up to 175 tons. There is a constantly increasing melt in the district. Most buying is for immediate delivery, and melters are eager to have shipments rushed through, showing that they are needing the iron, the inducements of lower freight rates after July 1 not appealing to them in that event. The Sheffield maker, quoting $18.50, Birmingham, while others are asking up to $20 for Southern iron, seems to be getting most of that business, their sales last week being about 500 tons. The Granite City maker's shipments now are greater than its production, shipments being made from stock. The only inquiry of note is for 15,000 tons and is from a local broker. On spot delivery 50c. more than prices quoted below is paid on Northern irons.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.40 freight from Chicago and $5.74 from Birmingham and 90 cents average switching charge from Granite City:

Northern foundry, sil. 1.75 to 2.25 (third quar.)	$25.90
Northern malleable, sil. 1.75 to 2.25 (third quar.)	25.90
Basic (third quar.)	25.90
Southern foundry, all rail, sil. 1.75 to 2.25	$24.24 to 25.74
Southern foundry, water and rail, sil. 1.75 to 2.25, f.o.b. St. Louis	22.74

Finished Iron and Steel.—A considerable buying movement from fabricators is expected to manifest itself shortly. For some time fabricators have not maintained any stocks, buying only from the mills as they received construction jobs. These fabricators have been able to get quick shipments from mills, which have been competing keenly for this sort of business with speedy deliveries as one of the inducements. Fabricators are now realizing that the mills are well sold up, and that it is impossible to get steel in the same prompt manner that they have been getting it. The result is that they now are preparing to place orders for fall deliveries to take care of business that they are going after. The coal shortage adds to the complexities of the situation, making it more difficult for the mills to take on more business even for fall deliveries. There has been some hand to mouth buying during the last week of the few mills that now can take care of these orders, which amount to considerable in the aggregate. Buying by railroads centering in this district continues. The Missouri, Kansas & Texas is in the market for about 400 tons of plates, and the Wabash wants 100 tons of tank plates. The Missouri Pacific has an inquiry out for 100 freight car axles.

For stock out of warehouse we quote: Soft steel bars, 2.57½c. per lb.; iron bars, 2.57½c.; structural shapes, 2.67½c.; tank plates, 2.67½c.; No. 10 blue annealed sheets, 3.72½c.; No. 28 black sheets, cold rolled, one pass, 4.45c.; cold drawn rounds, shafting and screw stock, 3.50c.; structural rivets, $3.19½ per 100 lb.; boiler rivets, $3.29½; tank rivets, 7/16 in. and smaller, 60 per cent off list; machine bolts, large, 50 and 10 per cent; small, 50-10 and 10 per cent; carriage bolts, large, 55-5 per cent; small, 60 and 10 per cent; lag screws, 60 per cent; hot pressed nuts, square or hexagon blank, $3.50; and tapped, $3.25 off list.

Coke.—The coal strike situation still adds strength to the market for coke. The demand continues strong, and buyers are urgently insisting on immediate shipments, indicating that they need the coke badly or they would wait until after lower freight rates become effective after July 1.

Old Material.—The market for old material has taken a turn for the better. Consumers are beginning to take more interest in buying. The American Steel Foundries, for instance, which had held up shipments for four or five weeks, now has asked that deliveries be made and dealers are eager to cover on prior sales. There is a strong demand for car wheels and special grades of steel such as couplers and knuckles and springs, in which there appears to be a shortage. Foundry grades also are strong.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Old iron rails	$16.75 to $17.25
Steel rails, rerolling	14.25 to 14.75
Steel rails, less than 3 ft	15.00 to 15.50
Relaying rails, standard section	25.00 to 28.00
Cast iron car wheels	18.25 to 18.75
No. 1 heavy railroad melting steel	14.00 to 14.50
No. 1 heavy shoveling steel	13.00 to 13.50
Ordinary shoveling steel	12.50 to 13.00
Frogs, switches and guards, cut apart	14.00 to 14.50
Per Net Ton	
Heavy axle and tire turnings	9.50 to 10.00
Steel angle bars	12.00 to 12.50
Iron car axles	23.00 to 23.50
Steel car axles	17.00 to 17.50
Wrought iron bars and transoms	18.50 to 19.00
No. 1 railroad wrought	12.75 to 13.00
No. 2 railroad wrought	11.75 to 12.25
Railroad springs	15.50 to 16.00
Steel couplers and knucklers	15.50 to 16.00
Cast iron borings	9.50 to 9.75
No. 1 busheling	11.00 to 11.50
No. 1 railroad cast	11.50 to 16.00
Stove plate and light cast	12.75 to 13.25
Railroad malleable	12.50 to 13.00
Pipe and flues	7.75 to 8.25
Machine shop turnings	6.00 to 6.50

Cleveland

Ford Motor Co. Buys Large Tonnage of Ore—Price Concession in Pig Iron

CLEVELAND, June 27.

Iron Ore.—A fair volume of open market sales are being made. The Ford Motor Co. is the largest buyer, having purchased during the week slightly over 500,000 tons of ore, which was about evenly divided between two ore firms. The Ford company purchases ore for its furnace now operating and its second furnace, which has not yet been placed in blast, but which the company plans to start in operation some time during the year. It is understood that the Ford company will secure about 40,000 tons of ore from its own mine and this, with what it has just purchased, will supply its requirements for the year. Several sales of lots of 50,000 tons and under are reported and considerable inquiry is pending, including a few 100,000-ton lots. Several long term contracts have been closed since the season's prices were named, including one for 150,000 tons a year for a five year period. Some of the sellers are now figuring on inquiries aggregating from 200,000 to 300,000 tons. The demand is largely for non-Bessemer, but there is also considerable call for manganiferous ore. Some business is developing in the East. Two sales of non-Bessemer ore for Eastern shipment, one of 50,000 tons and the other of 25,000 tons, are reported and in addition a large Eastern interest has taken 70,000 tons of manganiferous ore. The coal strike is hindering buying somewhat. A number of furnaces that buy on the open market are doing figuring with sellers, but owing to the uncertainty as to the extent of their future operations because of the scarcity of coal and coke, they are hesitating about placing orders for ore. Some of the Valley district steel companies having mining connections are placing orders for nearly as much ore as they have taken in any previous year. Shipments are increasing rapidly and are expected to be between 6,000,000 and 7,000,000 tons during June. The total amount of lake ore on hand at furnaces and Lake Erie ore docks June 1 was 23,024,774 tons, as is shown by the monthly report of the Lake Superior Iron Ore Association. This compares with 27,839,620 tons on the same date a year ago. On June 1 there was 16,531,729 tons of lake ore on hand at furnaces. Of this 8,933,447 tons was at interior furnaces in the central district, 1,787,336 tons was at Eastern furnaces, and 5,810,946 tons was at lake front furnaces. During May there was 3,293,964 tons of lake ore consumed, as compared with 3,058,929 tons during April.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, $5.95; Old range non-Bessemer, 51½ per cent iron, $5.20; Mesabi Bessemer, 55 per cent iron, $5.70; Mesabi non-Bessemer, 51½ per cent iron, $5.05.

Pig Iron.—Sales fell off considerably during the

week as compared with the previous week or two and new inquiry is very light. The market generally is firm, although competition for business outside the immediate territory resulted, in one case, in a price concession by a lake furnace of $1 per ton on foundry iron to $22 for shipment to the Pittsburgh territory. This price was named to meet a $23 Valley price that has been quoted by one Valley furnace which has now marked its price up to $24. Another Valley furnace that has been holding to $24 for foundry iron has advanced its price to $25 for prompt shipment, but is still quoting $24 for the third quarter. Lake furnace quotations for their usually recognized territories remains at $23 to $24, the latter price for local shipment. One Cleveland producer is holding to $24 for all delivery points and reports sales of about 5000 tons during the week, including one lot of 600 tons at that price for shipment to a competitive Ohio point. A Dayton, Ohio, foundry placed 700 tons of foundry iron with a southern Ohio district producer at a reported price of $22.50. The United Engineering & Foundry Co., Pittsburgh, placed 1000 tons of foundry iron with a lake furnace. The Westinghouse Electric & Mfg. Co. purchased 525 tons of foundry iron from a Cleveland furnace for its local plant for July shipment. A Toledo foundry purchased 900 tons of malleable iron. A Western Pennsylvania furnace booked one 1000 ton order and is considering a price advance to $23.50. Most sales are for the third quarter, but a little business is being booked for the fourth quarter. The expected demand for basic iron for July shipment has not yet materialized. One round lot of basic iron has been withdrawn from the market by an Ohio steel plant that will need the iron. The Otis Steel Co. may start up its second furnace shortly, but there is a possibility that one or two other Ohio furnaces may go out of blast because of the coke situation. Small lot sales of Southern iron are reported at $18.50. Two price advances of $1 per ton each were made during the week on Lake Superior charcoal iron, which is now quoted at $28.50.

Quotations below are f.o.b. local furnace for Northern foundry iron, not including a 56c. switching charge. Other quotations except basic are delivered Cleveland, being based on a $1.96 freight rate from Valley points, a $3.36 rate from Jackson and a $6.67 rate from Birmingham:

Basic, Valley furnace	$25.00
Northern No. 2 fdy., sil. 1.75 to 2.25	$23.00 to 24.00
Southern fdy., sil. 1.75 to 2.25	24.67 to 25.17
Ohio silvery, sil. 8 per cent	33.86
Standard low phos., Valley furnace	34.00 to 35.00

Bolts, Nuts and Rivets.—Bolt and nut makers are getting a good volume of orders and prices are holding firm at the recent advance. Some of the manufacturers have covered about all their regular customers with third quarter contracts, much of this business being taken before the price advance. Rivet manufacturers are taking a good volume of contracts for the third quarter at the recent advance in prices and report a good volume of miscellaneous sales. Specifications on second quarter contracts are heavy, consumers generally taking all the rivets remaining due on these contracts.

Semi-Finished Steel.—Demand is not active. A local mill during the week sold about 4000 tons including two 1000-ton lots, one of sheet bars and the other of billets. Prices are unchanged at $35, Cleveland or Youngstown.

Finished Material.—With heavy specifications on mill books for extended future delivery, the volume of business is not quite as heavy as during May but is still in excess of shipments, so that mills are getting further behind on deliveries and consumers are crowding harder for material. Few mills are seeking additional business. The 1.60c. price on steel bars, plates and structural material has not yet entirely disappeared but is named only for extended future delivery and prices quoted by some independent mills that can make fairly early shipments have stiffened. The Midvale Steel & Ordnance Co. has advanced its prices $2 per ton to 1.80c. on steel bars, plates and shapes, and another mill has advanced its price to 1.95c. Mills seem to have no trouble in booking light plate orders in small lots at 2c. to 2.10c. Two new inquiries for plates for oil tanks have appeared, one for 1900 tons and the other for 2500 tons. A new inquiry has come from the Standard Oil Co. for stills requiring 500 tons and the Grasselli Chemical Co. is inquiring for tanks requiring 160 tons. Automobile companies are keeping close to maximum production but are hampered somewhat by lack of steel, particularly forging bars. While there is little evidence yet of a falling off in the demand for motor cars, many automobile manufacturers have orders on mill books for their requirements until about Sept. 1 and some in view of the expected lessening in the demand for cars are not ordering material in as large lots as two weeks ago. Some new business is still coming from this source, including one lot of 500 tons of bars. Implement manufacturers are getting busier and are ordering more material. Building work continues to come out in good volume. The Ann Arbor Railroad has placed 1800 tons of rails with the Midvale Steel & Ordnance Co.

Reinforcing Bars.—Demand for reinforcing bars continues active, particularly in small lots. Recent round lot awards brought out attractive prices on soft steel bars. However, rerolled bars are firmer and at least one mill has advanced its minimum price to 1.70c. Contracts placed include: South High School, Columbus, 250 tons to Concrete Steel Co.; Studebaker Corporation, Cleveland, service building, 210 tons to the Massillon Reinforcing Bar Co.; building for E. L. Dawes, Rochester, Pa., 100 tons to Massillon Reinforcing Bar Co. New inquiries include: Central High School Columbus, 750 tons; North High School, Columbus, 230 tons; Vahey Oil Co., Youngstown, warehouse, 200 tons; Hardware & Supply Co., Akron, warehouse, 400 tons; West Seventy-third Street Bridge, Cleveland, 230 tons.

Sheets.—The sheet market appears firmer but price irregularities continue. Some independent mills are still quoting black sheets at 3.15c. and blue annealed at 2.40c. for early shipment. Quotations range from the American Sheet & Tinplate Co.'s prices up to 3.40c. on black, 2.60c. on blue annealed and 4.40c. on galvanized. Specifications on contracts continue heavy. Good sized lots of automobile body sheets are being placed for the third quarter, much of this business going at 4.75c.

Warehouse Business.—With slower mill deliveries the demand on jobbers' stocks is growing heavier. The Carnegie Steel Co. has advanced its warehouse price on blue annealed sheets to 3.46c.

Jobbers quote steel bars, 2.41c.; plates and structural shapes, 2.51c.; No. 9 galvanized wire, 3c.; No. 9 annealed wire, 2.50c.; No. 28 black sheets, 3.90c. to 4c.; No. 28 galvanized sheets, 4.90c. to 5c.; No. 10 blue annealed sheets, 3.25c. to 3.46c.; hoops and bands, 3.06c.; cold-rolled rounds, 3.20c.; flats, squares and hexagons, 3.70c.

Coke.—Prices on Indianapolis by-product coke for both furnace and foundry grades have been advanced $1.50 per ton to $9 at oven. Connellsville foundry coke is also firmer, the only make reported available being now quoted at $7.75. Wise County foundry coke is quoted at $6.50 to $7. Sales are limited to occasional car lot orders.

Old Material.—There is some activity in blast furnace scrap, but otherwise the market is very dull and prices are weak. No new sales of borings and turnings for blast furnaces are reported, but dealers are buying these grades to cover recent orders. Borings and turnings are quoted at around $14.50 delivered Youngstown. One local dealer is offering $12.50 for machine shop turnings either for Cleveland or Youngstown delivery. Mills have good stocks of heavy melting steel scrap and some are holding up shipments. Prices are unchanged.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	$15.25 to $15.50
Steel rails, under 3 ft	15.75 to 16.00
Steel rails, rerolling	16.00 to 16.50
Iron rails	14.00 to 15.00
Iron car axles	18.00 to 19.00
Low phosphorus melting	16.00 to 16.25
Cast borings	12.50 to 12.75
Machine shop turnings	11.50 to 12.00
Mixed borings and short turnings	12.50 to 12.75
Compressed steel	12.85 to 13.25
Railroad wrought	14.00 to 14.50
Railroad malleable	15.50 to 16.00
Light bundled sheet stampings	10.00 to 10.25
Steel axle turnings	13.00 to 13.50
No. 1 cast	17.00 to 17.50
No. 1 busheling	11.25 to 11.75
Drop forge flashings over 10 in	11.00 to 11.50
Drop forge flashings under 10 in	11.25 to 11.75
Railroad grate bars	14.00 to 14.50
Stove plate	14.00 to 14.50
Pipes and flues	11.00 to 11.50

Cincinnati

One Seller Books Considerable Southern Iron at $18, Birmingham

CINCINNATI, June 27.

Pig Iron.—The market during the past week was very dull, the sales, with few exceptions, being for small tonnage for nearby shipment. The inquiry is light, and this condition is expected to continue till after the Fourth of July. Shipments on contracts are heavy, however, and the movement of high priced iron contracted for two years ago is very satisfactory. There seems to be a disposition on the part of melters who have iron held on furnace yards to put the past behind them, and while these shipments might affect the demand for a short period, the situation will be much healthier when this iron is taken in. While the position of the furnaces is regarded as strong, some weakness developed in the Southern market, where a furnace, in order to secure an order book, took on considerable early shipment iron at $18, Birmingham, base. This price, however, will be advanced as soon as sufficient tonnage is booked to furnish a backlog. Some high silicon Southern irons, for which there is little demand, have also been offered at $18 base. For third and fourth quarters, however, the range is for $18.50 to $20. Northern irons are firm at $23.50 in all districts, and with the difficulty experienced in securing sufficient coke to operate, higher prices are probable. Silveries are only in fair demand, but special irons are being taken in fair tonnages. The largest sale reported during the week was of 2500 tons of Bessemer to the Wheeling Steel Co., the iron coming from an Ironton stack, and will, it is understood, be shipped by river. A Louisville melter bought 1000 tons of Southern iron for third quarter, and a Dayton, Ohio, melter 600 tons of low phosphorus for the same delivery. An Indiana melter took 800 tons of Southern foundry and an Ohio melter 500 tons for last half. In addition to these sales, we note a sale of 500 tons of ferromanganese in this district for June and July shipment, at $70, seaboard. The only inquiry before the trade is from the Louisville & Nashville Railroad for 1000 tons of various grades for third quarter shipment.

Based on freight rates of $4.50 from Birmingham and $2.52 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$22.50 to $23.00
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	23.00 to 23.50
Ohio silvery, 8 per cent	35.02
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	26.02
Basic Northern	26.52
Malleable	26.52

Finished Material.—The demand for black sheets is particularly heavy at the present time, and no trouble is experienced in securing 3.40c. for any kind of delivery. Automobile body sheets are also commanding premiums, and while the range of prices is from 4.50c. to 5c., the capacity of the mills having the former price is booked up so tightly that manufacturers are willing to pay the higher figure to insure early delivery. Delivery promises on sheets with most mills now run from eight to ten weeks. On the heavier products, bookings are still being made subject to mill conditions, and only the most desirable specifications are being considered. Prices are firming up considerably, and while 1.60c. on bars, shapes and plates is still heard of, 1.70c. is the prevailing quotation for early delivery. There is good demand for wire products at unchanged prices. The Big Four Railroad is inquiring for its third quarter requirements of bolts and nuts, bars, billets, plates, nails and other wire products, bids to close on July 7. A nearby spring manufacturer is in the market for 700 tons of spring steel for third quarter, and is having difficulty in placing the tonnage. Up to the present mills operating in southern Ohio have been able to run to capacity, and it is not expected that there will be any interruptions due to the coal strike. There is little new activity in the structural field, and the number of awards made during the week was light, being mostly for tonnages less than 100. A number of projects are still pending, however, and some sizable awards are expected early this week.

Warehouse Business.—Local warehouses are getting the benefit of the sold up condition of mills, which is delaying deliveries on contracts and forcing manufacturers to place orders for their immediate requirements with jobbers. Bars, shapes and plates are moving in good volume, and the demand for wire products continues good. Metal manufacturers are also good buyers of sheets. Prices, while showing no change, are very firm, and higher quotations are expected to be named within the next week or two.

Jobbers quote: Iron and steel bars, 2.75c. base; hoops, 3.60c.; bands, 3.35c. base; shapes and plates, 2.85c. base; reinforcing bars, 2.82½c. base; cold-rolled rounds, 3.35c. base; flats, squares and hexagons, 3.85c. base; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, 4.50c.; No. 28 galvanized sheets, 5.50c.; No. 9 annealed wire, $2.70 per 100 lb.; common wire nails, $2.85 per keg, base.

Fluorspar.—Some smaller producers of fluorspar have advanced their price to the level of the larger producers, and the market is firm at $16 to $17.50.

Coke.—The demand for foundry coke is picking up and prices from all districts are at least 50c. a ton higher. There is no furnace coke available from other than by-product ovens, and this is being held at around $8 per ton. Connellsville foundry is quoted at $8 to $8.50, New River at $8 and Wise County at $7. Alabama foundry coke is quoted at $5.50, and by-product at $7, Connellsville basis.

Old Material.—There was a fair demand for borings and turnings for shipment out of the district, and as a result prices are up 50c. on each grade. Locally the scrap market is dull.

We quote dealers' buying prices, f.o.b. cars:

Per Gross Ton	
Bundled sheets	$8.00 to $8.50
Iron rails	13.50 to 14.00
Relaying rails, 50 lb. and up	26.50 to 27.00
Rerolling steel rails	13.50 to 14.00
Heavy melting steel	13.00 to 13.50
Steel rails for melting	13.00 to 13.50
Car wheels	14.50 to 15.00
Per Net Ton	
No. 1 railroad wrought	11.50 to 12.00
Cast borings	9.00 to 9.50
Steel turnings	8.00 to 8.50
Railroad cast	14.00 to 14.50
No. 1 machinery	16.00 to 16.50
Burnt scrap	9.50 to 10.00
Iron axles	18.00 to 18.50
Locomotive tires (smooth inside)	11.00 to 11.50
Pipes and flues	6.50 to 7.00

Foundry Protest Against Ferromanganese Duty

Stephen C. Mason, secretary the McConway-Torley Co., Pittsburgh, has written Congressman Guy C. Campbell a strong letter of protest against the proposed duties on ferromanganese in the new tariff. He points out that the duty of $33.60 is thirteen times the rate in the Payne-Aldrich law, eight times as high as the Dingley rates and almost five times as high as the rates in the McKinley bill. Mr. Mason also drew attention to the fact that the ten year pre-war average selling price of ferromanganese in the United States was $47 a ton. He declared the proposed rate as preposterous and suggested a rate not to exceed $5 a ton on ferromanganese and that manganese ore be put on the free list.

Senate Changes on Tariff Measure

WASHINGTON, June 27.—The duties determined upon by the Senate vary so comparatively little with those adopted by the House that it is believed there will not be much difficulty in determining upon final rates when the bill goes to conference. The House duty of 2 1/5c. on ferromanganese was equivalent to $39.42 per ton, based on the 80 per cent grade, while the Senate duty of 1⅞c. per pound is equivalent to $33.60, making a difference of $5.82 a ton. The duty of 1c. per pound on manganese ore, estimating that it takes 2 1/5 tons of the 48 per cent grade to produce one ton of ferromanganese, is equivalent to $23.65, so that the actual protection on ferromanganese, based on the Senate duty, would be $9.95 per ton, or the difference between the duty on the ore and the ferromanganese.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Plates

Sheared, tank quality, base, per lb.....1.60c. to 1.75c.

Structural Material

Beams, channels, etc.....1.60c. to 1.75c.

Iron and Steel Bars

Soft steel bars, base, per lb.....1.60c. to 1.75c.
Refined iron bars, base, per lb.....2.10c. to 2.20c.

Hot-Rolled Flats

Hoops, base, per lb.....2.40c. to 2.60c.
Bands, base, per lb.....2.40c. to 2.60c.
Strips, base, per lb.....2.40c. to 2.60c.

Cold-Finished Steels

Bars and shafting, base, per lb.....2.10c.
Strips, base, per lb.....4.00c.

Wire Products

Nails, base, per keg	$2.40 to $2.50
Bright plain wire, base, per 100 lb.	2.25
Annealed fence wire, base, per 100 lb.	2.25
Galvanized wire, base, per 100 lb.	2.75
Galvanized barbed, base, per 100 lb.	3.05 to 3.15
Galvanized staples, base, per keg	3.05 to 3.15
Painted barbed wire, base, per 100 lb.	2.55 to 2.65
Polished staples, base, per keg	2.55 to 2.65
Cement coated nails, base, per count keg	1.90 to 2.00
Woven fence, carloads	70½ per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads, 60, 10 and 10 per cent off list
Machine bolts, small, cut threads....60 and 10 per cent off list
Machine bolts, larger and longer.....60 and 10 per cent off list
Carriage bolts, ⅝ x 6 in.:
Smaller and shorter, rolled threads. 60 and 10 per cent off list
Cut threads .....60 per cent off list
Longer and larger sizes .....60 per cent off list
Lag bolts .....60, 10 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.:
Smaller and shorter .....50 and 10 per cent off list
Larger and longer sizes.....50 and 10 per cent off list
Hot pressed square or hex. blank nuts.....$4.50 off list
Hot pressed nuts, tapped .....$4.50 off list
C.p.c. and t. sq. or hex. nuts, blank.....$4.50 off list
C.p.c. and t. sq. or hex. nuts, tapped.....$4.50 off list
Semi-finished hex. nuts:
9/16 in. and smaller, U. S. S.....80 and10 per cent off list
⅝ in. and larger, U. S. S...75 and 10 and 10 per cent off list
Small sizes, S. A. E.....80, 10 and 10 per cent off list
S. A. E. ⅝ in. and larger...75 and 10 and 10 per cent off list
Stove bolts in packages.....80 and 5 per cent off list
Stove bolts in bulk.....80, 5 and 2½ per cent off list
Tire bolts .....65 per cent off list
Track bolts in carloads.....3.00c. to 3.25c. base
Track bolts, less than 200 kegs.....3.50c. to 3.75c. base

Cap and Set Screws

Milled square and hex. head cap screws, 75 and 10 per cent off list
Milled set screws.....75 per cent off list
Upset cap screws.....80 per cent off list
Upset set screws.....80 and 5 per cent off list

Rivets

Large structural and ship rivets, base per 100 lb.....$2.40
Large boiler rivets, base per 100 lb. 2.50
Small rivets .....70 and 5 to 70 and 10 per cent off list

Track Equipment

Spikes, 9/16 in. and larger, base, per 100 lb.	$2.25 to $2.35
Spikes, ½ in. and smaller, base, per 100 lb.	2.50
Spikes, boat and barge, base, per 100 lb.	2.50
Track bolts, base, per 100 lb.	3.25
Tie plates, per 100 lb.	$1.75 to 2.00
Angle bars, base, per 100 lb.	2.40

Welded Pipe

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	54½	28	¼ to ⅜	+ 3⅓	+22½
¼ to ⅜	60	33½	½	36½	18½
½	65	50½	¾	42½	27½
¾	69	56½	1 to 1¼	44½	29½
1 to 3	71	58½			

Lap Weld

2	64	51½	2	39½	25½
2½ to 6	68	55½	2½ to 6	42½	29½
7 to 8	65	51½	7 to 12	40½	27½
9 to 12	64	50½			

Butt Weld, extra strong, plain ends

⅛	50½	33	¼ to ⅜	+ 4½	+37½
¼ to ⅜	56	38½	½	35½	23½
½	62	50½	¾	42½	28½
¾	67	55½	1 to 1¼	44½	30½
1 to 1½	69	57½			
2 to 3	70	58½			

Lap Weld, extra strong, plain ends

2	62	50½	2	40½	27½
2½ to 4	66	54½	2½ to 4	43½	31½
4½ to 6	65	53½	4½ to 6	42½	30½
7 to 8	61	47½	7 to 8	35½	23½
9 to 12	55	41½	9 to 12	30½	18½

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2½ per cent.

Boiler Tubes

Lap Welded Steel		*Charcoal Iron*	
1¾ in.	26½	1½ in.	5
2 to 2¼ in.	41	1¾ to 1⅞ in.	15
2½ to 3 in.	52	2 to 2¼ in.	25
3¼ to 13 in.	57	2½ to 3 in.	30
		3¼ to 4½ in.	32

To large buyers of steel tubes a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes

Discounts on cold-drawn or hot-rolled tubes in carload lots, f.o.b. Pittsburgh, follow:

1 in.	60	2½ and 2¾ in.	43
1¼ and 1½ in.	52	3 in.	47
1⅝ in.	36	3½ to 4 in.	52
2 and 2¼ in.	39	4½ in. to 5 in.	44

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Tin Plate

Standard cokes, per base box.....$4.75

Terne Plate

(Per package, 200-lb.)

8-lb. coating	$9.30	25-lb. coating I. C.	$14.25
8-lb. coating I. C.	9.60	30-lb. coating I. C.	15.25
15-lb. coating I. C.	11.80	35-lb. coating I. C.	16.25
20-lb. coating I. C.	13.00	40-lb. coating I. C.	17.25

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.40c. to 2.50c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.15c. to 3.30c.

Galvanized

No. 28 (base), per lb.....4.15c. to 4.30c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.15c. to 3.25c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic.	$0.36	Buffalo	$0.295	Kansas City	$0.815	Pacific Coast	$1.665
Philadelphia, export..	0.265	Cleveland	0.24	Kansas City (pipe)...	0.77	Pac. Coast, ship plates	1.335
Baltimore, domestic...	0.35	Detroit	0.325	St. Paul	0.665	Birmingham	0.765
Baltimore, export.....	0.255	Cincinnati	0.325	Omaha	0.815	Memphis	0.43
New York, domestic...	0.38	Indianapolis	0.345	Omaha (pipe)	0.77	Jacksonville, all rail..	0.555
New York, export.....	0.285	Chicago	0.38	Denver	1.35	Jacksonville, rail and water	0.46
Boston, domestic	0.405	St. Louis	0.475	Denver (wire products)	1.415	New Orleans	0.57
Boston, export	0.285						

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 30,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 55c.; ship plates, 75c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 75c.; sheets and tin plates, 60c. to 75c.; rods, wire rope, cable and strands, $1; wire fencing, netting and stretcher, 75c.; pipe, not over 8 in. in diameter, 75c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

NON-FERROUS METALS

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
June	Lake	Electrolytic	New York	New York	St. Louis	New York	St. Louis
21.....	13.75	13.50	31.37½	5.80	5.55	5.72½	5.37½
22.....	13.75	13.50	31.25	5.80	5.55	5.70	5.35
23.....	13.75	13.50	31.12½	5.80	5.55	5.67½	5.32½
24.....	13.75	13.50	.....	5.80	5.55	5.67½	5.32½
26.....	13.75	13.50	31.00	5.80	5.55	5.62½	5.27½
27.....	13.75	13.50	31.00	5.80	5.55	5.62½	5.27½

New York

NEW YORK, June 27.

Quiet conditions prevail in all of the markets, though a few fairly substantial purchases of copper have been made. The tin market is affected by fluctuations in exchange. Lead is steady, but the price is slightly easier and the same holds true of zinc.

Copper.—Although copper is obtainable from some sellers for early delivery at 13.50c., refinery, for electrolytic, a substantial sale was made to-day for July-August-September at 13.87½c. delivered. Three of the largest users in the country have covered for their last half requirements at the same price, their purchases totaling 10,000,000 lb. or more. Lake copper is quoted at about 13.75c.

Tin.—The tin market has been quiet during all of the past week, the last important activity taking place on the 20th, which was mentioned in last week's reports. There has been no business to speak of, this situation being due in part to the violent fluctuations in sterling exchange, making it difficult for traders to operate. That feature still continues but to a modified degree. The market is drifting, apparently awaiting some new development. Heavy arrivals indicate that there is no shortage of tin, but on the other hand there are no large holders of it. The 2500 tons which arrived on June 17 by the steamship Knight Templar will mostly go direct to consumers, and the remainder is in strong hands. London cables to-day show quotations there as follows: Spot standard, £152 7s. 6d.; spot future, £153 10s.; spot Straits, £155 10s.; Singapore price, £157.

Lead.—A quiet but fairly steady market is reported. There have been slight recessions in price. The American Smelting & Refining Co.'s price remains at 5.75c., New York, and in the outside market 5.80c. is being obtained, the latter price being about 5c. per 100 lb. below that of a week ago. Lead is firmer at St. Louis than at New York, quotations there not being below 5.55c.

Zinc.—Zinc prices have eased slightly within the past week, now being obtainable at 5.27½c. to 5.30c., St. Louis; or 5.62½c. to 5.65c., New York. Some makers will not sell at these prices and prefer to await a revival of more active buying, which they believe will come as soon as there is any prospect of a settlement of the coal strike.

Old Metals.—Business is better this week and values are firmer. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	13.50
Copper, heavy and wire	12.75
Copper, light and bottoms	11.00
Heavy machine composition	10.25
Brass, heavy	8.00
Brass, light	6.50
No. 1 red brass or composition turnings	8.75
No. 1 yellow rod brass turnings	7.50
Lead, heavy	4.875
Lead, tea	3.75
Zinc	3.00

Aluminum.—The price of the Aluminum Co. of America for 98 to 99 per cent virgin metal continues at 19.10c., with the same grade of imported metal available at about 18c.

Antimony.—Wholesale lots for early delivery are obtainable at 5c., New York.

Chicago

JUNE 27.—The market is easier, as users are now generally fortified with a little stock ahead and the threatened railroad strike has made them more cautious. Copper, lead and zinc have declined. Old metals are unchanged. We quote in carload lots: Lake copper, 14c.; tin, 32.50c.; lead, 5.60c.; spelter, 5.35c.; antimony, 7c., in less than carload lots. On old metals we quote: Copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 8.75c.; red brass, 8.25c.; yellow brass, 6.75c.; lead pipe, 4.25c.; zinc, 2.75c.; pewter, No. 1, 20c.; tin foil, 22.50c.; block tin, 25c.; all buying prices for less than carload lots.

St. Louis

June 27.—Both lead and zinc were lower this week. We quote lead at 5.55c., car lots, and slab zinc at 5.30c. On old metals we quote: Light brass, 3.50c.; heavy red brass and light copper, 7c.; heavy yellow brass, 4c.; heavy copper and copper wire, 7.50c.; zinc, 2c.; pewter, 15c.; tin foil, 16c.; tea lead, 2c.; aluminum, 9c.

NEW FREIGHT RATES

Charges Effective on July 1—How They Are Figured—Finished Steel List

PITTSBURGH, June 27.—The reduction in freight rates on finished iron and steel products to become effective Saturday is 10 per cent to all points, regardless of the percentage increases set up by the advance on Aug. 26, 1920. This, it will be recalled, amounted to 40 per cent in the Eastern classification territory, embracing all of the section east of the Mississippi and north of the Ohio and Potomac rivers; 25 per cent in the Southern territory; 35 per cent in the old Western classification territory; 25 per cent in the Mountain Pacific territory and 33 1/3 per cent on shipments from the Southern territory into Eastern classification territory.

The new rates are arrived at by deducting 10 per cent from those now in effect. The rules provide that should the resultant figure bring a fraction of less than 0.24, the fraction is dropped. If the fraction is from 0.25 to 0.74, the fraction is figured as ½c., while in case the fraction is 0.75 and over, the next highest round figure is adopted.

By way of example, the present rate from Pittsburgh to Philadelphia is 36c. per 100 lb. A reduction of 10 per cent brings 32.4c.; under the rules, the new rate becomes 32.5c. On the other hand, the present rate to New York is 38c. A 10 per cent cut results in a figure of 34.2c., but under the rules issued the new rate is 34c.

For the present there is to be no change in the rates of shipments of material for export. It is understood that the Eastern roads wanted to put in a reduction in export rates at short notice but this was refused by the Interstate Commerce Commission. The expectation is that the reduction will be made as of Aug. 1.

The new rates are:

Phila. (domestic)	32.5c.	Omaha	73.5c.
Baltimore	31.5c.	Omaha (pipe)	69.5c.
New York	34c.	Denver	$1.215
Boston	36.5c.	Denver (wire prod.)	$1.275
Buffalo	26.5c.	Pacific Coast	$1.50
Cleveland	21.5c.	Pacific Coast (ship plates)	$1.20
Detroit	29.5c.	Birmingham	69c.
Cincinnati	29.5c.	Memphis	39c.
Indianapolis	31c.	Jacksonville, all rail	50c.
Chicago	34c.	Jacksonville, rail and water	41.5c.
St. Louis	43c.	New Orleans	51.5c.
Kansas City	73.5c.		
Kansas City (pipe)	69.5c.		
St. Paul	60c.		

The new rate on pig iron from Valley furnaces to Pittsburgh common rate points drops from $1.96 to $1.76.

British Iron and Steel Market

England Buying Belgian Rails—Home Market Almost Flat Again—Coke Lower—Continental Steel Unsettled

(By Cable)

LONDON, ENGLAND, June 27.

Pig iron demand is developing more slowly than was expected. This is particularly true as to home consumers, but there is little more doing for export, especially to Germany. America is inquiring, but business is difficult to arrange. Hematite has a tendency to become easy and prices are lower.

Ore is hard to sell, and weaker.

Merchant trade in finished steel is moving very slowly and the markets generally are featureless. Roumania and the Balkan states are doing a little in sheets and wire. Japan is inquiring for bars and sheets. Present exchange favors new buying, and sheets to Japanese specifications have been sold at £15 5s. (3.00c. per lb.) f.o.b.

Birmingham has bought 1000 tons of Belgian tram rails. The price is held secret, but it must have been very low.

Japan is reported to have rejected a big parcel of Continental wire rods, on the ground of quality.

Tin plate is firm, with good general inquiry, including Portugal, Norway, Italy and Germany.

Galvanized sheet demand is disappointing.

Continental steel is unsettled, merchant bars being sold at £7 15s. to £8 5s. (1.52 to 1.62c. per lb.) for July to September shipment. Belgian 3/16-in. plates have been sold at £8 17½s. (1.74c. per lb.) cost and freight to India.

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $4.40 per £1, as follows:

Durham coke, delivered	£1	6½s.				$5.83	
Cleveland No. 1 foundry	4	15				20.90	
Cleveland No. 3 foundry	4	10				19.80	
Cleveland No. 4 foundry	4	7½				19.25	
Cleveland No. 4 forge	4	2½	to	4	5	18.15 to	$18.70
Cleveland basic	4	10				19.80	
East Coast mixed	4	12½	to	4	13½	20.35 to	20.57
Ferromanganese	15	0				66.00	
Ferromanganese*	14	10	to	14	15	63.80 to	64.90
Rails, 60 lb. and up	7	17½	to	9	10	34.65 to	41.80
Billets	7	0	to	8	0	30.80 to	35.20
Sheet and tin plate bars, Welsh	7	7½				32.45	
Tin plates, base box	0	19½	to	0	19¾	4.29 to	4.35
						C. per Lb.	
Ship plates	9	5	to	10	0	1.82 to	1.96
Boiler plates	13	0	to	14	0	2.55 to	2.75
Tees	9	10	to	10	10	1.87 to	2.06
Channels	8	15	to	9	15	1.72 to	1.92
Beams	8	10	to	10	0	1.67 to	1.96
Round bars, ¾ to 3 in.	9	10	to	10	0	1.87 to	1.96
Galvanized sheets, 24 g.	15	12½	to	15	15	3.07 to	3.09
Black sheets	12	0				2.36	
Steel hoops	12	0	&	12	5*	2.36 &	2.41*
Cold rolled steel strip, 20 g.	23	2½				4.54	
Cotton ties, Indian specifications	15	0				2.95	

*Export price.

Continental Prices, All F.O.B. Channel Ports, Delivery as Specified

No. 3 foundry pig iron:							
Belgium, June	£4	12½s.	to	£4	15s.	$20.35 to	$20.90
Luxemburg, June	4	12½	to	4	15	20.35 to	20.90
France, June	4	12½	to	4	15	20.35 to	20.90
Basic pig iron:							
Luxemburg, June	4	6	to	4	7	18.92 to	19.14
Billets:							
Luxemburg, June	6	5				27.50	
Lorraine, June	6	5				27.50	
Wire nails (keg basis):							
Germany, August	0	14½				3.19	
Wire rods, 5 mm. (0.2 in.):							
Belgium, June, July	7	5				31.90	
Angles:						C. per Lb.	
Belgium, June, July	7	10	to	7	12½	1.47 to	1.50
Tees:							
Belgium, June, July	8	5				1.62	
Channels:							
Belgium, June, July	7	10	to	7	12½	1.47 to	1.50
Merchant bars:							
Belgium, July	7	13½	to	8	0	1.51 to	1.57
Luxemb'g, July, Aug.	8	0				1.57	
Germany, July, Aug.	8	0	to	8	7½	1.57 to	1.65
France, July	8	5	to	8	10	1.62 to	1.67
Joists (beams):							
France, July, Aug.	7	7½	to	8	0	1.45 to	1.57
Belgium, July, Aug.	7	7½	to	7	10	1.45 to	1.47
Luxemb'g, June, July	7	15	to	8	0	1.52 to	1.57
Belgium, June, July	8	2½				1.60	
⅛-in. plates:							
Germany, July, Aug.	9	5				1.82	
Belgium, July	8	0	to	8	2½	1.57 to	1.60
Luxemburg	8	10				1.67	
⅛-in. plates:							
Germany	9	0				1.77	
No. 8 gage wire:							
Belgium, July, Aug.	14	10				2.85	

Steel Makers' Association Reduces Prices—Demand for Pig Iron and Steel Poor

LONDON, ENGLAND, June 15.—After a period of nearly three months, the Amalgamated Engineering Union has decided to accept the masters' proposals by a majority of over 36,000 votes, and the men concerned returned to work on Wednesday. One of the main hindrances to improved business in the home trade is therefore removed, but the general state of the iron and steel works' order books is so poor that there is very little employment and it will be some time before trade gets on its feet again.

The demand for pig iron, both for home and export, is still poor, and export sales have declined considerably. The little support of buying by America seems to have stopped, as low offers made lately, both of Scotch foundry and of East Coast hematite, have been unsuccessful. Scandinavia is about the most interested customer, and even here the tonnages involved are not important; inquiries are received from Germany for special irons. No alterations have been made in quotations for Cleveland pig iron, and No. 3 G.M.B.'s is still quoted at 90s to 95s for either home or export. Stocks of hematite are accumulating owing to the slow demand, and fears are entertained lest production will have to be curtailed, unless the position considerably improves, now that the industrial air is cleared. In the meantime, East Coast mixed numbers are somewhat weak, and quotations are at 95s to 96s.

At the end of last week, the Steel Makers' Association decided on an all-round reduction of 10s in domestic prices, following on the concessions on the railroad rates, and also the fact that the end of the engineers' dispute was in view. Contrary to expectations, however, these concessions have so far met with but little response. Some of the works contend that they cannot afford to sell at this new figure, and are not attempting to book orders. Of course, it is fuel and raw material mainly that must be reduced to lower levels. In export, there is a certain amount of demand but the orders coming through are for very indifferent quantities. Indian railroads have been inquiring for rails and fish plates but the tonnage is meagre, while a few odd parcels of various kinds of material have been sold for South Africa and South America. Australian demand has diminished, while that of Japan is quite a dead letter.

It has been officially announced that a provisional agreement has been made between Messrs. Bolckow, Vaughan & Co., and Messrs. Redpath Brown & Co., for the combination of their interests, but at the same time the two businesses will be carried on under the same management as before. Bolckow, Vaughan & Co. have, within the last few years, acquired controlling interests in several companies, including the Eston Sheet & Galvanizing Co., the Darlington Rolling Mills and Intermediates and Explosives, Ltd. The issued capital of Bolchow, Vaughan & Co. amounts to nearly £5,000,000, while that of Redpath Brown & Co. is £175,000.

Bridgeport Activity Increases

Industrial activity in the Bridgeport manufacturing district, based on reports of 31 factories, for the week ended June 17 reflects a gain which has been consistent during the past few months. While the number of employees has not materially changed, the number of man-hours of employment shows an increase, being at 60 per cent of estimated normal for the week ended June 17. The average number of hours per week in the Bridgeport factories is 48.1 per cent, which is 98.2 per cent of the normal rate.

PERSONAL

A. B. Neumann, for the past three years consulting engineer on the staff of the Steel & Tube Co. of America, has opened offices as a consulting engineer in the People's Gas Building, Chicago. Mr. Neumann designed the two-vessel Bessemer steel works of the Steel & Tube Co. at Indiana Harbor, which was completed late in 1921, and in 1916 laid out part of the original plant of the Mark Mfg. Co. at that location, which was constructed in 1917 and 1918. He also designed and constructed the East Works of the American Rolling Mill Co., Middletown, Ohio, and the Allenport, Pa., plant of the Pittsburgh Steel Products Co. He was connected with the engineering department of the Indiana Steel Co. in a responsible capacity when the Gary Steel Works was designed and built. Recently he has been engaged in making appraisals of steel power and manufacturing plants.

A. B. NEUMANN

Arthur Simon, electrical engineer, Cutler-Hammer Mfg. Co., Milwaukee, has been elected president of the Engineers' Society of Milwaukee. Fred H. Dorner, M. E., for ten years secretary of the society, was elected vice-president and presented a gold watch in appreciation of long and faithful service. Fred T. Goes, M. E., Vilter Mfg. Co., was elected secretary.

Prof. Stanislaus Zovski, member of the faculty of the college of engineering, University of Michigan, has resigned to become professor of hydraulic engineering at the Polish Polytechnical University in Warsaw and will assume his new duties about Sept. 1.

George S. Whyte, president Macwhyte Co., Kenosha, Wis., manufacturer of wire cable, rope, etc., was elected for a second term as president of the Kenosha Manufacturers' Association at the recent annual meeting.

William N. Nank has resigned as auditor of the Carroll Foundry & Machine Tool Co., Bucyrus, Ohio, and is now with the Mason Tire & Rubber Co., Kent, Ohio.

F. L. Bishop of the University of Pittsburgh was elected secretary of the Society for the Promotion of Engineering Education at its meeting in Chicago last week.

W. H. White has been appointed representative in New York by the Mahr Mfg. Co., Minneapolis, Minn., manufacturer of oil burning equipment. Mr. White is an engineer and has had a wide experience in the iron and steel industry. His New York office is at 56 Murray Street. The Mahr Mfg. Co. has also appointed as Boston manager H. M. Cooper, whose office is at 50 Congress Street. In Buffalo, the company has appointed John O. Connolly, whose office is at 403 Liberty Building, that city. At Milwaukee the company is now represented by W. L. Strickler, 642 Marshall Street, who will work out of the Chicago office. The company will soon open an office also in Baltimore. All of these men are engineers and experienced in the general metal-working field.

W. H. Bischoff has joined the staff of the Dominion Iron & Steel Co., Sydney, N. S., and will occupy the position of general superintendent. For the past three years he has been with the Lukens Steel Co., at Coatesville, Pa., prior to which he was assistant superintendent to H. E. Price at the Sydney plant of the Dominion Iron & Steel Co.

A. H. Ferbert has been appointed traffic manager of the Pittsburgh Steamship Co., Cleveland, to succeed E. C. Collins, who resigned as vice-president and traffic manager to become assistant to Horace S. Wilkinson, chairman board of directors Crucible Steel Co. of America. Mr. Ferbert has been connected with the traffic department of the company since 1904. F. I. Baker has been appointed first assistant in the traffic department in Cleveland and H. C. Strom, Western manager with headquarters at Duluth. D. C. Potts will be transferred from the Duluth office to the traffic department in Cleveland and R. J. Peachman from the traffic department in the Cleveland office to the Western manager's office at Duluth, all the changes becoming effective July 1.

Dr. George K. Burgess, who was elected this week president of the American Society for Testing Materials, and is chief of the division of metallurgy of the Bureau of Standards, has been associated with the bureau since 1903. He has long been actively prominent in a number of engineering and scientific societies and is the author of numerous scientific papers. Recently he was elected a member of the National Academy of Sciences; he has been a representative on the American Engineering Standards Committee for the Department of Commerce since the organization of the standards committee; he is vice-chairman of the iron and steel committee of the American Institute of Mining and Metallurgical Engineers; a member of the engineering division and of the division of research extension of the National Research Council; chairman of the joint committee on the investigation of sulphur and phosphorus in steel; a member of the advisory boards on tables of annual constants and of critical constants, and a member of the National Research Council's correlating committee on corrosion. As chairman of the metals committee of the Federal Specifications Board he has been actively concerned with the question of unifying Government specifications for metals. Dr. Burgess was born at Newton, Mass., Jan. 4, 1874, and was graduated from the Massachusetts Institute of Technology in 1896. He taught physics at the Massachusetts Institute, at the University of Michigan and at the University of California prior to his joining the Bureau of Standards. In 1901 he wrote "Recherches sur la Constante de Gravitation," and at that time in Paris was made a doctor of science. Some of his more recent publications relate to thermal stresses in chilled iron and steel car wheels and the properties of special steels containing zirconium and other elements; tests of centrifugally cast steel; governmental research; the Government laboratory and industrial research.

DR. GEORGE K. BURGESS

A. L. Humphrey, president Westinghouse Air Brake Co., Wilmerding, Pa., accompanied by his wife and son, Frederick, sailed on the Olympic from New York, June 24, for a three months' business trip to Europe, during which he will study economic conditions abroad and confer with officials of the company in branch offices in England, France, Italy and Germany.

A. J. Maskrey, for eleven years general superintendent of the Carnahan Sheet & Tin Plate Co., Canton, Ohio, has been appointed general manager of the Falcon Tin Plate Co., Canton, which recently took over the Carnahan plant. Charles A. Streb, formerly secretary and paymaster of the Carnahan company, has become general superintendent of the Falcon company.

Nelson E. Gage, formerly connected with the Standard Tool Co., Cleveland, has been appointed sales manager of the National Tool Co., Cleveland.

Gifford K. Simonds, Simonds Saw Co., Fitchburg, Mass., has been made president of Waltham Watch Co., Waltham, Mass., to succeed Ezra C. Fitch, Brookline, Mass., who becomes chairman of the board.

W. G. Rich, coke sales manager, Providence Gas Co., Providence, R. I., has returned from Atlantic City, where he has been convalescing after a serious illness.

H. H. Richardson has assumed new duties as manager of the district sales office at St. Louis of the Youngstown Sheet & Tube Co., Youngstown, Ohio, having been transferred from the company's district office at Dallas, Tex. C. E. Hutchinson, a salesman in the Cleveland office of the company, has been assigned to take charge of the Dallas branch. Mr. Richardson went from the St. Louis territory to become manager at Dallas several years ago, while Mr. Hutchinson had been connected with the Cleveland branch for a number of years. At St. Louis, Mr. Richardson succeeds H. L. Miller, who resigned after eight years as district sales manager to join the Jones & Laughlin Steel Co., Pittsburgh, in the same capacity at St. Louis.

J. S. O'Connor, 315 Beatty Building, Houston, Tex., has been appointed agent for Texas for the Track Specialties Co., New York.

James J. Zimmerman, formerly assistant superintendent of the Scott foundry department of the Reading Iron Co., Reading, Pa., has joined the engineering force of the Elliott Co., Jeannette, Pa.

E. W. Cannell has been appointed manager of sales extension for the Osborn Mfg. Co., Cleveland. He has been with the company for over 10 years, part of the time as advertising manager.

George S. Barton, president and treasurer of the Rice, Barton & Fales Machine & Iron Co., Worcester, Mass., has recently returned from a several months' trip through Europe.

Willard L. Case has resigned as treasurer of the Yale & Towne Mfg. Co., Stamford, Conn., to accept a partnership in the firm of Searle, Nicholson, Oakey & Lill, accountants and engineers, New York. He will be succeeded by J. H. Towne, secretary of the company, who becomes secretary-treasurer.

William B. Way, Pittsburgh, has been elected secretary and treasurer of the Natural Gas Association of America.

Charles M. Schwab has been elected chairman of the board of directors of the Chicago Pneumatic Tool Co., New York, succeeding John R. McGinley, who resigned a few months ago. Mr. McGinley will remain as a director.

Wilson Bennett, metallurgical engineer, Wellington, New Zealand, was a visitor in Pittsburgh last week inspecting the iron and steel plants in that district. He commented favorably on conditions among steel and other manufacturing plants, especially the sanitary surroundings for workmen in the mills and the provisions taken by the employers for the safety of the men. He was accompanied by James McIntosh, also of Wellington, who took educational films showing the processes of iron and steel manufacture in the plants visited.

Guy Hamilton has returned to the sales department of the Osborn Mfg. Co., Cleveland.

Arthur V. Davis, president Aluminum Co. of America, Pittsburgh, has sailed for Europe.

The Pressed Steel Car Co. has received a judgment of $37,000 against the Union Pacific Railway Co. on a claim which originally amounted to more than $1,000,000. The claim originated in an old agreement whereby the railway company would give much of its car construction to the car company. The judgment is based upon profits that would have been made on 700 work cars, if built by the Pressed Steel Car Co., and $10 royalty on 200 gondola cars.

The report that the Lockhart Iron & Steel Co., Pittsburgh, which some time ago bought the plant of the Sligo Iron & Steel Co., South Connellsville, Pa., will start up in a week or two, is incorrect. The plant is a producer of bar iron, but plans for putting it in operation are indefinite. It may start later in the year.

OBITUARY

WALTER H. DUCKWORTH, cashier and assistant treasurer the National Tube Co., Pittsburgh, died June 25, at his home in Ben Avon, Pa., after a long illness. He was born in Brooklyn, N. Y., where he received his early education. When a young man he entered the employ of the National Tube Co. in its New York office, in a minor capacity in the accounting and financial departments. He was promoted to the cashiership which he held for 20 years prior to being made assistant treasurer five years ago. When the company moved its general offices to Pittsburgh, he was transferred. He was a member of the Masonic fraternity. He is survived by his wife and a daughter.

WILLIAM E. SNYDER, chief mechanical engineer, American Steel & Wire Co., with which he was affiliated for 26 years, died at his home in Pittsburgh, June 24. He was 54 years old. He was president of the Pittsburgh section, American Society of Mechanical Engineers, and a past president of the Engineers' Society of Western Pennsylvania. He received his education in the Curry Institute and Duquesne College, Pittsburgh, and the Pennsylvania State College, being graduated from the latter in 1896.

J. W. SEEKINGS, since 1911 secretary-treasurer of the Bridgeport Screw Co., died June 14. He was born in England in 1865, and was for many years in the employ of the Dominion Wire Mfg. Co., Montreal, Canada, where he eventually became assistant to the president.

Possibilities of Car Shortage

"It is time to raise very seriously the question whether the railroads are not approaching another period of congestion of traffic and 'shortage of cars,'" says the *Railway Age*. "On May 31 the number of idle freight cars was 504,702. This does not indicate any danger of a shortage of equipment. But let us consider some other facts. The number of cars loaded with freight in the week ended May 28 was 821,121. The number loaded with coal was 74,241 less than in the same week of 1921 and 83,242 less than in the same week of 1920. If coal loadings had been normal the total number of cars loaded would have been approximately 900,000.

"It is but a matter of time until the coal strike will be settled, after which, owing to the depletion of coal stocks, the railroads undoubtedly will be called on to move at least 100,000 loads of coal weekly more than they are moving. Experience in the fall of 1919 and again in 1920 showed that with the facilities then available it was extremely difficult for them to handle more than 1,000,000 carloads of all freight weekly.

"It is evident, therefore, that a large increase of coal shipments and a continuance of the increase of other traffic would soon tax them to their capacity. But will other traffic continue to increase? There are strong reasons for believing it will. First, crop prospects, especially in the West, are unusually good. Second, building operations are growing throughout the country. Third, there are many signs that the stocks that most manufacturers and merchants have on hand are low, and that as the signs of returning prosperity become more numerous and convincing the demand for the raw materials of manufacture, as well as for finished products, will grow rapidly.

"It would appear that the only thing needed to give the railways a business that will break all records is a settlement of the coal strike. If this is the case, the only possible way to avoid car shortages and congestions within a few months are, first, to speed up the repairs of all equipment that is not in serviceable condition; secondly, to speed up the construction of new equipment and railroad improvement work already ordered; and, third, to begin an effective campaign to secure the most efficient utilization possible of all available railroad facilities."

Trade Changes

F. H. Crawford, machinery dealer, has moved to 299 Broadway, New York.

Reading Brass Works, Inc., Reading, Pa., has changed its address to 141 Schiller Street, Reading, Pa.

The V. & O. Press Co., Dry Harbor Road, Glendale, L. I., manufacturer of presses and machinery, is completing plans for a new one-story factory, 100 x 500 ft., on Cooper Avenue.

Donnelly & Co., iron and steel jobbers, Philadelphia, have moved from 317 Vine Street to 531 North Fourth Street, that city.

The engineering staff of the Strauss Bascule Bridge Co. has been reorganized with officers as follows: J. B. Strauss, president and chief engineer; C. A. Ellis, vice-president and engineer in charge of design; P. L. Kaufman, assistant secretary and contracting engineer; C. E. Paine, designing engineer. The New York office, formerly in charge of Mr. Vincent, has been discontinued and new Eastern offices opened at room 603 Albee Building, Washington, in charge of J. C. Eversman.

The Chicago office of the Thomas Spacing Machine Co., formerly at 1243 Monadnock Block, has removed to Room 936 in the same building.

The Dallas, Texas, branch sales office of the Youngstown Sheet & Tube Co., Youngstown, Ohio, has been moved from the Dallas State & County Bank Building to the Magnolia Building, occupying rooms 1401 and 1402.

The Brooks Forge & Machine Co., Inc., is now the name of the Brooks Machine Co., York, Pa.

The corporate style of Robertson & Jackson, Inc., 221 Grand Avenue, Milwaukee, has been changed to Frank F. Jackson & Co., following the retirement of Andrew K. Robertson. The Jackson company will continue to act as representative of Fenestra steel sash, fireproof doors, including Kinnear rolling shutters, reinforcing bars, etc. Mr. Robertson has opened offices at 445 Milwaukee Street as Wisconsin representative of the Concrete Steel Co.

The American Abrasive Metals Co., 50 Church Street, New York, manufacturer of feralun, alumalun, vulcalun and bronzalun anti-slip treads, announces its appointment by the Carborundum Co., Niagara Falls, to act as United States sales representatives for marketing the Carborundum anti slip tile.

The Northwest Engineering Co., Green Bay, Wis., manufacturer of crawler cranes and draglines, announces the removal of the general sales offices to 1220 Steger Building, Chicago. W. W. Mutter, vice-president, has assumed active charge of this office. Activity in the fields reached by the Northwest organization has increased to such a degree that it has been found necessary to operate nights at the Green Bay plant.

The Bradley Co., dealer in new and used railroad, industrial and other equipment, B. F. Jones Building, Pittsburgh, has extended its business to include rolling mill equipment, steel plant work, heating and annealing furnaces and the like. The new department is in charge of J. E. Schlieper.

The John L. Taylor Co., machinery dealer, Philadelphia, has moved to a new combined office and warehouse at 211 North Third Street.

The Victor-Peninsular Co., screw machine products, Detroit, has changed its address to 4646 Lawton Avenue.

The U. S. Electro Galvanizing Co., has change its name to the U. S. Galvanizing & Plating Equipment Corporation, 32 Stockton Street, Brooklyn, N. Y.

The Universal Electric Welding Co., has moved from 67-69 Sixth Street to 90 Webster Avenue, Long Island City, N. Y.

The factory site and buildings of the Ericsson Mfg. Co., Buffalo, N. Y., maker of Berling magnetos, will be sold by court order, through the receivers on July 25. The property consists of nearly 12 acres of land, modern buildings and equipment of tools, raw materials and completed stock. The receivers are W. A. McDougal and R. E. Powers, 1100 Military Road, Buffalo, and the attorneys are Abbott & Abbott of the same city.

H. S. Hammond, 905 Crozer Building, Philadelphia, has purchased the Girard Machine Co., and in the future business will be carried on under that name.

The Builders' Iron & Steel Co., has moved its factory and office to 25 Garvey Street, Everett, Mass.

Directors of the Newton Steel Co., Youngstown, Ohio, on June 19 authorized an initial dividend of $1.50 per share on common stock, and the regular quarterly payment of $1.75 on preferred, both payable July 1 to holders of record June 20. The company is booked ahead for several months at a capacity rate.

Aluminum Co. of America May Lease Aluminum Manufacturers, Inc.

Plans are under way by which Aluminum Co. of America, Pittsburgh, may lease for a period of 25 years the Aluminum Manufactures, Inc., the latter having plants for the manufacture of aluminum ware at Cleveland, Detroit, New Haven, Conn., and Buffalo, and also two other plants which have not been active for some time. The Aluminum Manufactures, Inc., was organized in November, 1919, and during the first four months of 1920, the company reported a loss of more than $750,000; during the second four months a profit of $200,000 but during the last four months a loss of $160,000. The net loss for 1921 was $250,000. During the first five months of the present year the company broke even on operations. The Aluminum Co. of America offers to lease the property of the Aluminum Manufactures, Inc., for a period of 25 years dating from July 1, 1922; to purchase the entire inventory at the market value, July 1, 1922; and to purchase $708,700 par preferred stock at $65 a share and accrued dividends, and the retirement of 2000 shares a year of premerred stock. Concerning the outlook for dividends on the common stock, the lease provides for the payment of $1 a year in 1924; $1.50 a year in 1925 and thereafter for the 23 years remaining of the lease $2 a year. A special meeting of the stockholders of the Aluminum Manufactures, Inc., has been called to be held in Cleveland on June 29, at which the matter of leasing the company to the Aluminum Co. of America for a period of 25 years will be acted upon and a vote taken.

Commonwealth Edison Co.

In its annual report for 1921, the Commonwealth Edison Co., Chicago, now said to be the largest electric distributing company in the world, reports electric operating revenues of $37,139,831 and operating expenses of $24,396,155. After taxes the gross income was $9,527,330. Interest, $2,834,042, and dividends, $4,307,126, were paid, the latter to 24,571 stockholders. Dividends have been continuous since 1889, and for some years have stood at 8 per cent. Addition of $1,059,659 to surplus brought that account to $9,183,217. Assets are reported at $152,035,421, of which plant and equipment account for $118,275,716. There are 536,982 customers on the books, and 1,928,271,940 kw. hr. of energy were generated in 1921; 2,140,247 tons of coal were burned.

Industrial Finance

The directors of the Reynolds Spring Co., Jackson, Mich., have declared a dividend of 1¾ per cent on the preferred "A" stock and also a dividend of 14 per cent, being all of the accumulated dividends on the preferred "B" stock. All of the dividends on both classes of preferred stock having now been paid in full in cash, the directors may at their discretion declare dividends on the common stock from time to time as in their judgment is deemed best. Donald Ford of Goodbody & Co., New York, members of the New York Stock Exchange, has been elected a director of the Reynolds Spring Co. to take the place of Rafe S. Craft, resigned.

The Orton & Steinbrenner Co., manufacturer of locomotive cranes, grab buckets and coal crushers, has moved its offices from the eleventh to the nineteenth floor of the Transportation Building, 608 South Dearborn Street, Chicago. The company now occupies the entire north end of the nineteenth floor.

The Bridgeport Brass Foundry, Inc., Bridgeport, Conn. has dissolved.

A preliminary certificate of dissolution has been filed by the Waterbury Standard Tool & Machine Co., Waterbury, Conn. Claims should be presented to Harry B. Jenkins, 53 Euclid Ave., that city.

Dividends on the common stock of the United Alloy Steel Co. have been resumed. A quarterly disbursement of 50c. a share, the first payment on that issue since January, 1921, has been ordered.

William Cramp & Sons Ship & Engine Building Co. 5 per cent serial notes, maturing Jan. 1, 1923 and July 1, 1923, have been called for redemption July 1, next, at 102½ and interest. The notes outstanding aggregate about $200,000.

The Waterbury Standard Tool & Machine Co., Waterbury, Conn., has filed a preliminary certificate of dissolution with the State Secretary of Connecticut, and all claims should be presented to Harry B. Jenkins, 53 Euclid Avenue, Waterbury.

The Youngstown Sheet & Tube Co. several days ago declared a dividend of 50c. per share on 800,000 shares of common stock, and the regular quarterly payment of $1.75 on preferred, both payable July 1 to stock of record June 20. The common dividend is unchanged from the last quarter. The Brier Hill Steel Co. authorized a quarterly dividend of $1.75 on preferred stock.

Machinery Markets and News of the Works

LARGE RAILROAD INQUIRIES

Burlington Issues List Covering 117 Items and Union Pacific Wants 73 Tools

Prospects for Railroad Buying Appear More Promising, But Purchases So Far Are Few

The issuance by the Burlington and Union Pacific railroads of large inquiries for machine tools revives interest in the possibility of important railroad buying within the near future. So far, however, the purchases of the railroads have been disappointingly small in comparison with the large number of tools that have been inquired for in recent months. The Burlington list contains 117 items and that of the Union Pacific 73 items. On the former inquiry, prices are requested by July 8 and on the latter list by July 10.

Other railroad inquiries include one from the Long Island, which asks prices on two axle lathes, a wheel press and a few other machines. The Erie Railroad is reported to have bought some used tools against its recent inquiry for 25 machines.

Price advances on a few lines of machine tools, forecasted last week, will probably take effect July 1. The Hendey Machine Co. has announced advances of from 4 to 8 per cent on lathes. A turret lathe builder has announced an advance and another company in the same line is expected to raise its prices from 5 to 15 per cent within a few days. On the other hand, some makers of low-priced lathes have made a further cut in prices.

While it may be somewhat too early to say that a definite turn for the better has come in the machine-tool trade, it is certain that each week brings a slight degree of improvement, though the volume of business is still far from satisfactory with most tool manufacturers and dealers.

The Studebaker Corporation, South Bend, Ind., has placed orders for a few tools and is expected to buy more liberally within the near future.

Vocational schools continue to ask for equipment. The Essex County schools, Newark, N. J., are asking bids on about 20 machines, while Lowell, Mass., has purchased about the same number of used tools.

Machine tool builders have quoted on about 20 machines for the San Diego Naval Air Station.

New York

NEW YORK, June 27.

The Long Island Railroad has inquired for two axle lathes, a wheel press and several other tools. The New York Central has added a horizontal boring and drilling machine to its recent inquiry, but has not yet placed any orders for the dozen or more tools on its list. The Erie Railroad has bought a part of its recent list of about 25 tools, but is reported to have acquired mostly used tools.

Machine-tool builders have submitted bids on about 20 tools, mostly small lathes, milling machines, shapers and drills for the San Diego Air Naval Station, San Diego, Cal.

The Essex County Vocational Schools, Newark, have placed an order for a number of lathes and have issued a new list calling for bids on about 20 machines, principally lathes, milling machines, drills, etc., and a few woodworking machines.

The Hendey Machine Co., Torrington, Conn., has announced an advance of 4 to 8 per cent on its lathes. The Wood Turret Machine Co., Brazil, Ind., has also announced an advance and another manufacturer of turret lathes is expected to advance its prices within a week or two.

The market for electric and overhead traveling cranes is quieter than in the past few weeks, but locomotive crane buying is increasing. The largest list now current for electric overhead cranes is the one from the M. W. Kellogg Co., Jersey City., calling for two 20-ton, three 10-ton, two 7-ton and one 5-ton cranes. In locomotive cranes a number of sales are reported. The Industrial Works has sold two 150-ton wrecking cranes to the New York Central & Hudson River Railroad and a 15-ton, 50-ft. boom locomotive crane to the Braun Lumber Co., Detroit. The Walsh Construction Co., Castleton, N. Y., has purchased two 15-ton used Ohio locomotive cranes from Philip T. King, 30 Church Street, New York. The Public Service Corporation, Newark, N. Y., has purchased a corduroy tractor dragline crane with ½-yd. bucket from the Pawling & Harnischfeger Co. The Western Maryland Railroad has bought a 40-ton locomotive crane. The Chase Metal Works, Waterbury, Conn., recently purchased five gasoline driven industrial trucks from the Towmotor Co., Cleveland. Davil & Averill, Waverly, N. J., have purchased a 10-ton, hand power crane from the Chisholm-Moore Mfg. Co., for a power house being constructed for the municipality of South River, N. J. Sanderson & Porter, New York, have purchased a Brownhoist No. 2, type C, gasoline driven tractor crane with ¾-yd. clamshell bucket from the Brown Hoisting Machinery Co.

The Erie Railroad Co., 50 Church Street, New York, will take bids at once for its one-story shop extensions at its car and locomotive repair works, Hornell, N. Y., estimated to cost about $300,000, including machinery. M. G. King, 71 West Twenty-third Street, is architect.

The New York Edison Co., 130 East Fifteenth Street, New York, has completed plans for a one-story power house at 454 West Twenty-seventh Street, to cost close to $30,000.

The National Motor Accessories Corporation, 47 Vesey Street, New York, manufacturer of radio instruments and parts, has plans in progress for extensive increase in production and proposes to purchase or construct plants in Pennsylvania and Virginia for this purpose. To carry out the expansion, a stock issue of $1,000,000 has been arranged. Henry F. Vortkamp is president, and Joseph E. Reider, assistant general manager.

A vocational department will be installed in the new senior and junior high school to be erected at Pennsylvania Avenue and South Main Street, Elmira, N. Y., bids for which are being taken by Pierce & Bickford, 118 Lake Street, architects. It is estimated to cost in excess of $200,000.

Benjamin Fox's Sons, 513 West Thirty-fourth Street, New York, operating an iron foundry, have filed plans for a two-story addition on adjoining site, 25 x 100 ft. John H. Kimbel, 305 West Forty-third Street, is architect.

Plans have been prepared for an addition to the two-story automobile service and repair works, 50 x 120 ft., of the General Baking Co., 342 Madison Avenue, New York, at 3240 Bronx Boulevard, used for company cars and trucks, estimated to cost close to $50,000.

The New York Steam Co., 280 Madison Avenue, New York, operating power plants for commercial service is disposing of a bond issue of $5,000,000, a portion of the proceeds to be used for extensions and improvements.

The Russell, Burdsall & Ward Bolt & Nut Co., Portchester, N. Y., has awarded a contract to the Schmidt Brothers Construction Co., 22 East Huron Street, Chicago, for a one-story addition, 50 x 200 ft., to its plant at Sterling, Ill., estimated to cost about $50,000.

The Pittsburgh Fuel Co., New York, has leased the water-front property at 129th Street and the Harlem River, totaling ten city blocks, and will convert the buildings

and site into a modern coal plant. A series of concrete coal pockets will be constructed, with complete coal-handling machinery. Plans for the installation will be prepared by the Guarantee Construction Co., 140 Cedar Street.

The United Lead Co., 111 Broadway, New York, has tentative plans under way for rebuilding the portion of its plant at Perth Amboy, N. J., recently destroyed by fire with loss estimated in excess of $500,000.

The Kruse Motor Co., 1111 Flatbush Avenue, Brooklyn, has awarded contract to the Rugge Construction Co., 189 Bay Nineteenth Street, for a one-story service building, with machine shop, 100 x 100 ft., at Nostrand Avenue and Avenue I, estimated to cost about $50,000.

The Fischer-Sweeny Bronze Co., 1301 Grand Street, Hoboken, N. J., manufacturer of bronze, aluminum and other metal castings, will take bids at once for a new one and two-story foundry and machine shop, to replace the portion of its works recently destroyed by fire. It will cost about $80,000. Lockwood, Greene & Co., 101 Park Avenue, New York, are architects.

Charles L. Cadle, superintendent of Public Works, Albany, N. Y., will receive bids until July 10, for equipment for the proposed power plant of the State at the Crescent Dam, Cohoes, N. Y., comprising: (A-1) Two hydraulic turbines with governor equipment and extra parts; and (A-2) two waterwheel driven generators and other electrical equipment.

C. J. Ernst, 1009 East Ferry Street, Buffalo, is arranging a list of machinery and equipment to be installed in his proposed automobile service and machine reair shop.

A high pressure, electrically-operated pumping plant will be installed in the Rockaway peninsula section, Newark, by the Department of Water Supply, Gas & Electricity, in connection with a new water supply for fire service in this district. Estimates of cost will be made at once. Commissioner Nicholas F. Hayes is in charge.

An automobile service and repair building to provide for company cars and trucks, with equipment for battery charging, etc., will be erected by the Imperial Laundry Co., Gould Avenue and Thirteenth Street, Newark, on adjoining property recently acquired. It will be 60 x 100 ft., and is estimated to cost in excess of $30,000.

The Public Service Electric Co., Public Service Terminal, Newark, has been granted permission to issue stock for $7,250,000, a portion of the proceeds to be used for plant extensions and improvements.

Bids will be asked early in August for a two-story high school, 175 x 195 ft., on Gibbons Street, Linden, N. J., to include a vocational department, estimated to cost about $350,000. Harold B. Brady, 333 North Broad Street, Elizabeth, N. J., is architect.

The Lasser Motor Co., 38-40 South Orange Avenue, Newark, have leased the building at 329 North Broad Street, Elizabeth, N. J., for the establishment of a branch service and repair works.

An automobile service and repair works for company cars will be established by the Union Steam Laundry Co., 888 Broad Street, Newark, in connection with a new four-story plant, 50 x 100 ft., on Campfield Place, to cost about $70,000. William E. Lehman, 738 Broad Street, is architect.

Philadelphia

PHILADELPHIA, June 26.

The Hurley Motor Co., 219 North Broad Street, Philadelphia, is taking bids for the erection of a two-story service building, with machine shop, 110 x 204 ft., at Thirty-first and Thompson streets. Clarence E. Wunder, 1415 Locust Street, is architect.

The Heintz Mfg. Co., Philadelphia, Leo I. Heintz, president, 2120 West Tioga Street, organized to manufacture heavy metal stampings, etc., has awarded contract to the William F. Newberry Co., Otis Building, for a new plant to occupy a portion of the site at Front and Olney streets, recently acquired. It will cost about $35,000.

The Atterbury Truck Agency, 1335 Frankford Avenue, Philadelphia, is having plans prepared for a one and two-story service building, 55 x 100 ft., at 1344-46 Frankford Avenue, to include a repair department. Edward Schoeppe, 315 South Fifteenth Street, is architect.

The Pennsylvania Equipment Co., Norwood, Philadelphia, is arranging for the purchase of a 10-ton electric traveling crane.

The Penn Motors Corporation, 1714 North Broad Street, Philadelphia, manufacturer of motor trucks and parts, has been consolidated with the Belmont Motor Co., Lewistown, Pa. The production of the combined company will be increased to include motor-driven cultivators and parts for agricultural service, metal sash, etc. The Penn company previously operated a plant at Riverton, N. J., and which was destroyed by fire about a year ago. Hilton W. Soffeld, president of the last noted organization, will be prominent in the new company.

The Studebaker Sales Co., 847 North Broad Street, Philadelphia, has leased a building at Thirty-first and Thompson streets as an extension to its service and repair works at this location.

Thomas Savill's Sons, 1310 Wallace Street, Philadelphia, manufacturers of plumbing equipment, etc., are arranging a list of equipment for installation in their addition, now under way, to include foundry apparatus, pipe-threading equipment, etc.

The Firth & Foster Co., Emerald and York streets, Philadelphia, will commence the immediate erection of a one-story power house, 50 x 65 ft., at its textile dyeing and finishing plant.

The Westinghouse Electric & Mfg. Co., Widener Building, Philadelphia, is taking bids for a ten-story building, 95 x 191 ft., at Thirtieth and Walnut streets, as a factory branch and district headquarters. Carson & Carson, 22 South Fifteenth Street, are engineers.

The Enterprise Mfg. Co., Third and Dauphin streets, Philadelphia, manufacturer of hardware specialties, is planning for the early installation of equipment at its new machine shop, now in course of construction.

The Freeman Electric Co., 803 East State Street, Trenton, N. J., will make improvements and extensions in a building at Mead and Prince streets, to cost about $50,000, to be equipped for an assembling works and manufacturing.

The Public Service Electric Co., Trenton, N. J., will build a new one-story power house on North Olden Avenue.

William A. Weinman, West Hanover and Barnes streets, Trenton, N. J., has revised plans under way for a three-story automobile service and repair works, 36 x 185 ft., on West Hanover Street. R. A. Schumann, 202 West State Street, is architect.

The Spartan Rubber Co., Trenton, N. J., has been organized with a capital of $100,000, to take over and operate the plant of the Zee Zu Rubber Co., Yardville, near Trenton, recently acquired from the receiver by Edward D. Newman, 29 Broadway, New York. Alterations will be made to the plant and the machinery improved. The company will specialize in the manufacture of automobile tires and tubes, giving employment to about 200 operatives. Mr. Newman is vice-president and secretary of the new company; Arthur Newman is president.

The Delaware County Electric Co., Chester, Pa., has arranged for a bond issue of $5,000,000, a portion of the proceeds to be used for extensions and improvements.

The Elliott Blair Steel Co., New Castle, Pa., has preliminary plans under way for the erection of a number of buildings, estimated to cost close to $250,000, including machinery. It recently booked a large order for the manufacture of steel parts for the Ford Motor Co., Detroit, and the new works will be arranged to handle this production.

The F. A. Burrows Mfg. Co., North Water Street, York, Pa., manufacturer of steam specialties, is planning for the installation of additional machinery.

The Eastern Pennsylvania Light, Heat & Power Corporation, Pottsville, Pa., has awarded a contract to the J. G. White Engineering Corporation, 43 Exchange Place, New York, for its proposed electric generating plant at Pine Grove, Pa., estimated to cost about $2,500,000. It will have an initial capacity of 25,000 kw.

A vocational department will be installed in the two-story and basement high school, 67 x 105 ft., to be erected at Ambler, Pa., estimated to cost about $120,000, for which bids are being taken on a general contract until July 1. S. S. Conover, 215 Susquehanna Avenue, Lansdale, Pa., is architect.

The Scranton Electric Co., Scranton, Pa., is disposing of a bond issue of $693,000, a portion of the proceeds to be used for additions and improvements.

The Susquehanna Casting Co., Wrightsville, Pa., has acquired property at New Oxford, Pa., for the erection of a new foundry.

The Southside Garage, New Castle, Pa., is planning for the installation of new machinery and tools in the repair department.

The Lancaster Electric Light, Heat & Power Co., Lancaster, Pa., has arranged for a preferred stock issue of $100,000, a portion of the proceeds to be used for extensions and improvements.

The Blue Mountain Slate Co., Slatedale, Pa., will build a new plant for cutting, finishing and other operations.

August N. C. Madsen, Nineteenth and Pemberton streets, Harrisburg, Pa., manufacturer of concrete blocks, etc., has tentative plans for an addition to more than double the present capacity. New mixing, molding and other equipment will be installed.

The Hanover Power Co., Scranton, Pa., has arranged for a bond issue of $630,000, a portion of the proceeds to be used for plant extensions and improvements.

Chicago

CHICAGO, June 26.

Prospective railroad buying has taken the center of the stage. Figures submitted on the Santa Fe list have all been tabulated and are now in the hands of the purchasing agent, with the probability that orders will be placed early this week. The Illinois Central tabulations have also been completed and early action as to the purchase of the machines is expected. The Burlington also will soon be ready to close on its list and in addition has issued a new inquiry for its Denver shops, covering 117 separate items. Figures on these machines are to be submitted to the railroad before July 8. Another large railroad inquiry covering 73 items has been put out by the Union Pacific System. Bids on these machines are to be filed before July 10.

Actual buying up to date is still of the scattering character. If no railroad orders are placed before the close of the month, sales totals for June will probably be equal to, or slightly better than, those for May. The Studebaker Corporation, South Bend, Ind., has placed three engine lathes and a milling machine for its tool room in addition to the special purpose machines ordered some time ago. Liberal orders for its production department are regarded as imminent. There is a general feeling in the machine tool market that general price advances will be announced in the near future, some of them probably on July 1. A five per cent advance in radial drills is among the changes expected. The machines on both the Union Pacific inquiry and the Denver list of the Burlington are to be arranged for motor drive with a few exceptions. The inquiries follow:

Chicago, Burlington & Quincy List

One 48-in. engine lathe, 108 in. between centers.
One 42-in. engine lathe, 96 in. between centers.
One slotter with 20-in. stroke and 48-in. diameter table.
One slotter with 16-in. stroke.
One 7½-in. heavy duty turret lathe.
One 4½-in. hollow hexagon turret lathe.
Two 3¼-in. hollow hexagon turret lathes.
One flat turret lathe to handle chuck work up to 16 in. in diameter.
One 2¼-in. universal hollow hexagon turret lathe.
Two 1½-in. universal turret screw machines.
Two full universal monitor lathes to swing 22 in. over ways.
One foot power squaring shear to shear No. 16 gage sheets and lighter with actual cutting length of 36 in. between housings.
One hand-bending roll to roll No. 16 gage and lighter, with 42 in. between housings.
One 32-in. engine lathe, 120 in. between centers.
One 30-in. engine lathe, 96 in. between centers.
One 36-in. engine lathe, 144 in. between centers.
Three 24-in. engine lathes, 120 in. between centers.
Two 24-in. engine lathes, 96 in. between centers.
One 24-in. engine lathe, 72 in. between centers.
One 24-in. engine lathe, 60 in. between centers.
One 28-in. engine lathe, 96 in. between centers.
One 18-in. engine lathe, 36 in. between centers.
Four 18-in. engine lathes, 48 in. between centers.
Two 18-in. engine lathes, 60 in. between centers.
Three 16-in. engine lathes, 36 in. between centers.
One bolt centering machine.
One 600-ton hydraulic driving wheel press to press wheels 90 in. in diameter.
One 100-ton hydraulic vertical type press to press bushings in locomotive side rods.
One 100-ton hydraulic horizontal type press to press piston heads on rods.
One 75-ton vertical power press.
One 50-ton vertical power press.
One 5000-lb. double frame steam hammer.
One 2000-lb. single frame steam hammer.
Two 1800-lb. single frame steam hammers.
One 500-lb. upright helve hammer.
One 200-lb. upright helve hammer.
One bending roll to roll sheets ¼ in. thick x 60 in.
One pneumatic flanging machine to flange cold boiler plates ⅛ in. thick and circular heads 48 in. in diameter.
One pneumatic flanging clamp, 180 in. between housings and 20 in. vertical adjustment of upper clamping beam.
One open end type bar iron shear to shear bars up to 1½ in. in diameter.
One open-end type bar iron shear to shear bars up to 2¼ in. in. diameter.
One double-end punch and shear with 36-in. throat to punch 1¼-in. hole in 1-in. plate and to shear 1-in. plates 7 in. wide.
One single-end horizontal type punch with 12-in. throat to punch 1-in. hole in 1-in. plate.
One double-end punch and shear to punch ⅝-in. hole in ⅝-in. plate.
One sheet metal cutter with 36-in. throat to cut steel sheets 5/16-in. thick.
Five pedestal dry grinders with double-end spindle to carry wheels 18 in. in diameter by 3-in. face.
Four pedestal dry grinders with double-end spindle to carry wheels 20 in. in diameter by 3-in. face.
One pedestal dry grinder with double-end spindle to carry wheels 14 in. x 1¼ in.
One pedestal dry grinder with double-end spindle to carry wheels 12 x 1¼ in.
One pedestal dry grinder with double-end spindle to carry wheels 6 in. in diameter.
One pedestal twist drill grinder to grind twist drills 1 to 3½ in. in diameter.
Two pedestal single type wet grinders to carry 24 x 1½-in. wheel.
One plain grinder with automatic feed to swing 12 in. over bed with 36 in. between centers.
One universal grinder with automatic feeds to swing 12 in. and take 48 in. between centers.
One vertical single-spindle grinder to grind 24-in to 100-in. radius on engine links 5 in. thick.
One oscillating surface grinder to grind plain surface on work 84 in. in length and 24 in. in height.
Four 48-in. grindstones mounted in metal casing for wet grinding.
One heavy duty upright drill to drill 5-in. holes on solid steel.
Two heavy duty upright drills to drill 4-in. holes in solid steel.
One heavy duty upright drill to drill 3-in. holes in solid steel.
Two 72-in. radial drills.
One 48-in. radial drill.
Two 32-in heavy duty crank shapers.
Two 28-in. heavy duty crank shapers.
One 24-in. crank shaper.
One 36-in. upright drill.
One 24-in. upright drill.
Three 20-in. upright drills.
One double spindle high speed drill press for drilling telltale holes, ¼ x 1½ in., in ends of staybolts.
One 96-in. vertical boring mill.
One 54-in. vertical boring mill.
One 42-in. vertical boring mill.
One 36-in. vertical boring mill.
One 30-in. vertical boring mill.
One 72 x 72-in. x 30-ft. planer.
One 36 x 36-in. x 10-ft. planer.
One 48 x 48-in. x 10-ft. planer.
One heavy duty plain milling machine with automatic feeds—50 in. longitudinal, 14 in. transverse and 20 in. vertical.
One heavy duty universal milling machine with automatic feeds—30 in. longitudinal, 10 in. transverse and 19 in. vertical.
One 2-in. forging machine.
One single head bolt cutter.
One triple head bolt cutter.
One double head staybolt and crownstay machine.
One pipe threading machine, capacity 2½ to 8 in. inclusive.
One pipe threading machine, capacity up to 2-in. pipe.
One pipe bending machine to bend pipes 1 to 8 in. inclusive.
One 3½-in. horizontal boring machine with 96 in. between end of spindle and face of outside housing.

Union Pacific System List

One 14-in. x 6-ft. heavy duty all-geared head quick change engine lathe.
One drill press, capacity ⅛-in. to 2¼-in. drills.
One 4-in. bench lathe, 36 in. between centers.
One 14-in. x 8-ft. compound quick change all geared head engine lathe.
One 24-in. x 8-ft. compound quick change all geared head engine lathe.
One 3½-ft. radial universal drill.
One 13-in. bench drill.
One carwheel boring mill with 54-in. diameter table to take wheels up to 48 in.
One high speed double spindle shaper.
One pattern maker's lathe.

One double disk sander with 37-in. disks, each with 20-in. x 42 in. metal table.

One 24-in. x 8-ft. compound quick change all geared head engine lathe.

One 28-in. heavy duty crank shaper.

One turret lathe with complete bar and chucking equipment, Warner & Swasey No. 2-A or equivalent.

One 14-in. x 6-ft. compound quick change all geared head engine lathe.

One extra heavy duty drill press, 36-in. swing.

One 24-in. engine lathe, 4 ft. between centers.

One 20-in. engine lathe, 6 ft. between centers.

One 36-in. x 72-in. 50-ton power forcing press.

One 5-ft. heavy duty radial drill.

One 42-in. heavy duty vertical boring and turning machine.

One air-driven flange clamp 16 ft. 2 in. between housings.

One 36-in. throat single end punch and shear, capacity 1-in. hole in 1-in. plate.

Two 30-in. high power double axle lathes.

One 20-in. x 8-ft. engine lathe.

One 30-in. x 10-ft. engine lathe.

One American No. 358, or equivalent, radial drill, twin motor driven.

One riveting machine for 1-in. diameter rivets.

One 42-in. vertical turret lathe.

One 50-ton forcing press, vertical capacity 60 in., 48-in. between housings.

One 30-in. planer.

One 2-in. threading machine.

One 4000-lb. single frame steam hammer.

One link grinder similar to that manufactured by H. C. Hannet & Co.

One horizontal boring bar, No. 32 Lucas, or equivalent.

One double horizontal boring machine, 12¼ in. and 13¾ in. center to center, distance top of table to center line of boring bars 9¾ in.

One heavy type pneumatic flanging machine to flange ¾-in. solid boiler plate.

One double head centering machine with 5-ft. bed, capacity to vise 5-16 in. to 4 in., capacity between spindles 30 in.

One 3-in. x 48-in. slip roll forming machine.

One adjustable pipe folder 30 in. long.

One 48-in. carwheel boring mill.

One 18-in. engine lathe, 5 ft. between centers.

One 40-in. engine lathe to take 10 ft. between centers.

Three 4½-in. x 8-ft. special locomotive cylinder boring bars.

One 12-ft. boilermaker's full pneumatic flanging clamp.

One 1-in. to 4-in. pipe cutting and threading machine.

One extra heavy double axle lathe.

One 18-in. engine lathe, 5 ft. between centers.

One 16-in. x 4-ft. center engine lathe.

One 36-in. heavy pattern sliding head drill press.

One J-28-in. Gisholt standard turret lathe.

One automatic safe end and cutting off machine, capacity up to 3-in. tubes, to cut safe ends 3 in. to 12 in. in length.

One 17-in. heavy duty engine lathe.

One 36-in.-44-in. side head boring mill.

One 24-in. heavy duty engine lathe, 6 ft. between centers.

Four heavy pattern 4-in. x 24-in. double emery grinders.

One 6-spindle automatic valve and cock grinder.

One No. 0 universal drill grinder, capacity ⅛ in. to 2½ in.

One universal grinding machine, 12-in. swing, 40 in. between centers, Brown & Sharpe No. 3 universal, or equivalent.

Two U. S. electric floor grinders.

Four No. 35 Ransom, or equivalent, grinding machines.

One Model 200, Type J. Norton, or equivalent, car wheel grinding machine.

One 4-spindle automatic cock grinder for grinding 1¼-in. air brake angle cocks.

The cranes for which the Burlington is in the market have not yet been purchased. The Whiting Corporation has booked the following orders: One 15-ton crane for the Rubberoid Mfg. Co., Joliet, Ill., and one 10-ton crane ordered by L. E. Myers, industrial engineer, for Tony, Wis.

The Chicago Macaroni Co., 2148 Canalport Avenue, Chicago, has let contract for a three-story plant, 60 x 88 ft., at the same address, to cost $47,000.

The Chicago Art Marble Co., 2883-87 Hillock Avenue, Chicago, has let a contract for a one-story factory to cost $38,000.

The Rockford Malleable Iron Works, Rockford, Ill., has secured a permit to build an addition, 80 x 120 ft., to cost $45,000.

The J. L. Clark Mfg. Co., Rockford, Ill., manufacturer of boxes, flour-sifters, tin cans, etc., has secured a permit to erect an addition to cost $29,000.

Forrest Vance, Urbana, Ill., has purchased the machine shop of Fred Ebling at 236 North Hickory Street, Champaign, Ill.

The construction of a power plant to cost $1,000,000 is said to be contemplated on a 1000-acre tract east of Parsons, Kan., on the Neosho River. The Kansas Gas & Electric Co. is said to be back of the project.

The Union Public Service Co., Canby, Minn., will reconstruct its power plant there at a cost of $200,000.

The Clarinda Mfg. Co., Clarinda, Iowa, has been incorporated with $75,000 capital stock to manufacture washing machines, lawn mowers and other devices and machinery. The officers are: President, Edwin Lisle; vice-president, William A. Turner; secretary-treasurer, A. A. Cambre.

The Public Service Co. of northern Illinois will start work at Waukegan, Ill., within two months on the construction of the first unit of an electric power plant to cost $25,000,000. This unit will cost $3,000,000.

The Terre Haute Grinding & Machine Co., a recently formed corporation at Terre Haute, Ind., has started operations in a plant at 717 Ohio Street. It will specialize on automobile machine work, particularly in the regrinding of cylinders and the furnishing of pistons and rings, bushings and starter gear bands. While the new company will do work for the individual automobile owner, it will cater largely to garages and automobile dealers.

The Lincoln Radio Corporation, 204-28 East Madison Street, Chicago, recently incorporated, will manufacture a complete short wave tuner, detector and two space amplifier radio receiving sets. The company is contracting out its manufacturing. J. H. Newman is president and treasurer.

The States Radio Corporation, 501 South Jefferson Street, Chicago, recently organized with $100,000 capital stock, has leased 7000 sq. ft. of space at the address given and is engaged exclusively in the production of radio frequency receiving and amplifying sets, employing non-regenerative circuits of the company's own design. It is manufacturing all the parts of these sets with the exception of the tubes. The officers are T. J. Thelin, president; Antoll Gollos, vice-president and chief engineer, and T. J. Hickey, secretary and treasurer. No further manufacturing equipment is needed at present.

The Chicago, Burlington & Quincy Railroad Co., 547 West Jackson Boulevard, Chicago, will soon take bids for the construction of a new power plant at Broadway, Washington and Clark streets, estimated to cost about $100,000. William T. Krausch, 547 West Jackson Boulevard, is company architect.

The Ideal Sheet Metal Works, 213 North Morgan Street, Chicago, has plans under way for a new three-story plant, 72 x 125 ft., at 2039-43 West Jackson Boulevard, estimated to cost about $75,000. M. O. Nathan, 70 West Monroe Street, is architect.

A vocational department will be installed in the new two-story high school, 96 x 120 ft., to be erected at Braham, Minn. G. L. Lockhart, 1363 University Avenue, St. Paul, Minn., is architect.

Fire, June 15, destroyed at portion of the main foundry of the Herzog Iron Works, Cypress Street, St. Paul, Minn., with loss estimated at about $35,000, including equipment. Preliminary plans are said to be under way for rebuilding.

The Standard Oil Co. of Indiana, Indianapolis, has preliminary plans in progress for an addition to its refinery at Laramie, Wyo.

The Denver & Rio Grande Railroad Co., Denver, Col., will rebuild the portion of the power house at its West Denver shops, recently destroyed by fire.

A vocational department will be installed in the high school to be erected at Bloomfield, Iowa, for which bonds totaling $135,000 have just been voted. William Gordon, 317 Hubbell Building, Des Moines, Iowa, is architect.

The City Council, Dubuque, Iowa, will install new pumping machinery in connection with extensions and improvements in the waterworks pumping plant, estimated to cost about $135,000. Mead & Seatone, Madison, Wis., are architects. E. Carr is city engineer.

The Western Colorado Power Co., Durango, Col., a subsidiary of the Utah Power & Light Co., Salt Lake City, Utah, has authorized a fund of $150,000 for power plant and system extensions and improvements.

A vocational department will be installed in the new high school to be erected at Rock Rapids, Iowa, estimated to cost about $130,000, for which bids on a general contract are being asked until July 17. Hugill & Blatherwick, Boyce-Greeley Building, Sioux Falls, S. D., are architects.

The Metropolitan Utilities District, Omaha, Neb., F. D. Wead, chairman of the board of directors, has plans under way for waterworks extensions and improvements to cost about $1,500,000. It will include the installation of new

pumping machinery and improvements in present equipment to cost approximately $250,000. The gas works will also be extended, with the installation of new machinery, estimated to cost about $500,000.

A vocational department will be installed in the new high school to be erected at Gordon, Neb., estimated to cost about $100,000. Bonds will be voted at a special election, June 30. E. B. Watson, Norwalk, Neb., is architect.

New England

BOSTON, June 26.

Perhaps the most significant feature of the machine-tool market in this district is the price cross currents noticeable in lathes. Two producers of standard lathes have advanced their prices 10 per cent and a similar appreciation at an early date in a line of turret tools is forecasted.. Makers of low-priced lathes, on the other hand, have made a further cut in prices, but state that the next move in quotations will be upward. While cross currents exist, it is the belief in the trade that a definite turn has come for all equipment. It has been pointed out that a slightly better movement of new equipment suggested that a better market for this line had come, and additional sales reported for the past week bear out this statement.

There have, however, been further sales of used equipment by manufacturers themselves, which have taken just so much business out of the hands of the machine-tool trade. The most important sale of this kind was made in Lowell, Mass. A list was issued by that city for 12 11-in. x 4-ft. South Bend engine lathes; one 15-in. x 5-ft. and one 16-in. x 6-ft. South Bend engine lathes; one 16-in. x 6-ft. Standard Lathe Works tool; one 14-in. Washburn sensitive drill; one Barnes 20-in. upright drill; one Greenfield No. 190 Wells universal cutter and reamer grinder; one Blount 11-in. x 4-ft. speed lathe; one Springfield 12-in. and one 15-in. crank shaper. A local manufacturer substituted a list of much higher priced lathes, shapers, etc., purchased in 1918, and used in production not more than six months at prices practically equivalent to those quoted on tools contained in the regular list. The city officials accepted the manufacturer's lump price. A Worcester manufacturer has sold lathes and shapers to a producer of textile machinery, the equipment in this instance being high-grade and prices comparatively low.

On the other hand a fairly good business was put through by representatives of machine-tool builders the past week Sales include 2-in. and 3-in. pipe machines to a Cambridge, Mass., manufacturer, who is inquiring for a large cold saw for crankshaft work; a large shaper to a Boston concern; a large screw machine to a Providence manufacturer; two automatic tapping machines to another Providence shop; a 16-in. x 8-ft. lathe to the Massachusetts Institute of Technology, and numerous other transactions involving a variety of tools to manufacturers of various products, as well as a 20-ton Manning, Maxwell & Moore crane to a central Massachusetts maker of textile machinery. The Boston & Albany Railroad is inquiring for a 90 in. wheel lathe and a box facing and boring machine; a Providence concern on a multiple spindle drill having a capacity for 12 1-in. holes; an electrical appliance manufacturer for a 56-in. cold saw with a vertical spindle, and there are several other inquiries which involve a considerable amount of new equipment that are contingent on manufacturers and shops securing certain contracts. Some of the inquiries that have been out for some time are expected to be closed this or next week. The new tool market, therefore, has indications of expanding.

Inquiries for and sales of used equipment continue to be reported, but are evidently growing fewer. One local dealer, who is disposing of the equipment of a fair sized Maine steel shipyard, reports inquiries for heavy machinery from Australia, British Columbia and various points along the Pacific Coast.

The demand for machine parts and small tools holds well, but is not as heavy as in May. One New England maker of micrometer calipers has a new list out, which shows a general reduction varying according to the size of the tool, and another maker of fine tools has reduced prices on certain items.

The equipment of the Dow Mfg. Co., 131 Adams Street, Braintree, Mass., was sold at auction last week. During the war the company made milling machines and subsequently washing machines.

Bids will close July 1 on a two-story, 50 x 100 ft. addition to cost approximately $150,000, contemplated by the Bantam Ball Bearing Co., Litchfield, Conn.

The Ironide Foundry Co., Inc., Ware, Mass., capitalized for $50,000, has incorporated under Massachusetts laws to do general foundry work. The incorporators are Edward A. Johnson, Watertown; Stephen R. Jones, Brockton, and Melvin T. Eckmann, Lynn.

The Hartford Auto Parts Corporation, Hartford, Conn., recently incorporated with a capital stock of $430,000 to take over the defunct Hartford Automotive Parts Co., organized the past week by the election of the following officers: President, Charles A. Dana, head of the Spicer Mfg. Corporation, South Plainfield, N. J.; vice-president, John S. Berry; secretary-treasurer, Paul D. Hawkins, all of Plainfield. The directors include Charles A. Dana, Lenore Carbaugh, Colonia, N. J., and Ezra P. Prentice, New York.

The National Can Co., 36 Washington Street, Boston, has completed plans for a new two-story factory, 100 x 175 ft., part three stories, at Dorcehster, Mass., estimated to cost about $300,000, including machinery.

A power house will be erected by the Oakhurst Dairy Co., Portland, Me., in connection with its new plant on Forest Avenue, estimated to cost about $100,000.

The Torrington Electric Light Co., Torrington, Conn., is considering the erection of a new steam power house at Franklin Street and Harwinton Avenue.

The Military Emergency Board, State Armory, Hartford, Conn., has plans in preparation for a one-story mechanical shop, 85 x 150 ft., at the rear of the State armory, estimated to cost about $40,000. Payne & Keefe, Manwaring Building, New London, Conn., are architects.

The Vermont & Quebec Power Corporation, Sutton, Vt., operating a hydro-electric power plant on the Missisquoi River, near Richford, Vt., is disposing of a bond issue of $300,000, a portion of the proceeds to be used for extensions and improvements. Charles H. Thompson is vice-president and general manager.

B. F. Smith & Co., 79 Milk Street, Boston, will build a one-story machine shop, 50 x 70 ft., on Cross Street, Somerville, Mass.

Rickets & Shaw, Monson, Mass., have plans nearing completion for a new power house to be used in connection with a textile mill. Reeds & Thorpe, Prospect Street, Hartford, Conn., are architects.

The Amesbury Electric Light Co., Amesbury, Mass., has made application for permission to issue stock for $81,000, the proceeds to be used in connection with plant additions and improvements.

The Fall River Metal Co., Fall River, Mass., has removed its plant from 247 Malden Street, to 43 Fourth Street, for increased production.

A vocational department will be included in the new high school to be erected by the town of Glastonbury, Conn. Brooks & Glazier, Lewis and Gold streets, Hartford, Conn., are the architects.

Cleveland

CLEVELAND, June 26.

The continued activity in the automobile field is stimulating the demand for machinery from that source and there is reported to be an increasing tendency among automobile makers to install single purpose production machinery to cut down manufacturing costs. With this object in view two Detroit manufacturers are figuring on considerable special multiple spindle drilling machine equipment and other Detroit automobile plants are adding small lots of additional machinery. Some activity is also noted on the part of automobile body builders. The Rubay Co., Cleveland, during the week purchased a lathe, milling machine and drilling machine and the Fisher Body Corporation purchased a large shaper and is figuring on other equipment.

A new inquiry from the Chicago, Burlington & Quincy Railroad includes several lathes which are being figured on by a local manufacturer. Five lathes on a list recently issued by the Illinois Central have not yet been purchased and the Erie Railroad has not yet placed orders against its recent list of 25 machines. It is expected that this road will buy mostly used machinery.

Local dealers report a fair volume of single tool orders and inquiries from well scattered sources. The demand for wood-working machinery has become quite active.

Crane inquiries are more plentiful but are mostly for single cranes. The inquiry of the Sandusky Cement Co. for three electric traveling cranes which came out several months ago has become active.

The Crucible Steel Castings Co., Cleveland, will shortly begin the erection of a new steel foundry. It secured a new site on Eighty-second Street, S. W., two or three years ago but later decided to postpone building. It is in the market for a 2-ton electric melting furnace and will probably purchase other equipment. At present it has a 1-ton electric melting furnace.

The Superior Foundry Co., Cleveland, has placed an order with the Whiting Corporation for a 78-in. cupola.

The Austin Co., Cleveland, has taken a contract for a foundry addition for the New Brighton, Pa., plant of the Standard Sanitary Mfg. Co.

The Arctic Ice Machine Co., Canton, Ohio, will erect a one-story factory, 42 x 460 ft., to be used as a heavy machine shop and erecting department. It manufactures ice making and refrigerating plants.

The Marion Curtain Rod Co., 191 Edwards Street, Marion, Ohio, has been formed with a capital stock of $20,000 to manufacture flat steel curtain rods. A plant now is in operation and it is stated that $5,000 will be expended in the purchase of additional machinery. George H. Spragg is president.

The Standard Mold Co., Akron, Ohio, manufacturer of tire molds, has placed contract for the erection of an addition.

The Mechanical Mold & Machine Co., Akron, Ohio, will erect a new machine shop, 76 x 126 ft.

Pittsburgh

PITTSBURGH, June 26.

The local machinery market has largely resolved itself into a price proposition. While inquiries for cranes, machine tools and other equipment are heavy and considerable figuring has been done on prospective orders, yet the amount of business actually placed is relatively small. One local company which sold 15 cranes last month reports it has done very little in June, but is figuring on a large amount of work. When the coal strike is out of the way and all danger of a railroad strike has passed, it is believed there will be heavy buying of machinery, as railroad purchasing agents evidently have instructions from officials to hold off placing orders until the danger is passed. One local railroad purchasing agent has accepted prices on two cranes, and the contract has been made up, prices being satisfactory, but the signature to the contract is being withheld. Builders of machine tools and also of cranes are not disposed to cut prices very much, preferring in some cases to lose the business, as they believe that later in the year the machinery market will be more active and prices may be a little higher than now.

The Board of Education, New Castle, Pa., sent out inquiries some time ago for about 10 lathes, a milling machine, a shaper, planer and also for some wood-working machinery. The bids were opened a few days ago, but at this writing the contract has not been placed.

Recently the machine shop at the Southside works of the Jones & Laughlin Steel Co. was almost entirely destroyed by fire and the company sent out inquiries for tools to replace those lost. It had certain tools in its equipment which had given splendid service and has placed orders for the same makes. Hence there was virtually no competition for this line of machinery. The rest of the equipment was divided around, the items including a drilling machine, a radial drill, shaper, large planer and other equipment. This is one of the largest orders placed here for some time.

The local office of the Milwaukee Electric Crane & Mfg. Co. has sold to the Westinghouse Electric & Mfg. Co., East Pittsburgh, one 5-ton, 3-motor electric crane, 47-ft. span, and a 10-ton, 3-motor electric crane, 47-ft. 6-in. span; also, a 7½-ton, 3 motor electric crane, 57-ft. 4-in. span, to the Koppel Car Repair Co., Koppel, Pa. The Northern Engineering Works, Detroit, has sold to the Greenville Steel Car Co., Greenville, Pa., a 3-motor, 10-ton electric crane with 69-ft. 10-in. span. The local office of the Shepard Electric Crane & Mfg. Co. has sold a 3-ton, 47-ft. span electric crane to the N. & G. Taylor Co., Cumberland, Md., and a 3-ton electric hoist to the C. L. Miller Co., Scottdale, Pa.

The Greenville Steel Car Co., Greenville, Pa., is building an addition to its plant for the manufacture of new steel cars. Considerable steel car fabricating machinery will be installed.

The Swan Coal Co., Knoxdale, Pa., has tentative plans for rebuilding the tipple at its plant damaged by an explosion June 17.

The Consolidated Light, Heat & Power Co., Huntington, W. Va., has plans under way for a two-story power house in the eastern part of the city to cost about $90,000.

The A. L. Black Coal Co., Morgantown, W. Va., is said to be planning to rebuild the tipple at its local mine, destroyed by fire June 19 with loss approximating $20,000.

The Chesapeake & Ohio Railroad Co., Richmond, Va., has plans under way for a new repair shop, power house and addition to engine house at Peach Creek, W. Va. F. I. Cabell is chief engineer.

The Standard Steel Spring Co., Coraopolis, Pa., manufacturer of automobile springs, etc., is taking bids for a one-story addition, 65 x 140 ft. A crane runway will be installed, with 10-ton electric traveling crane, about 60 ft. span.

The Penn Public Service Co., Johnstown, Pa., is disposing of a bond issue of $4,500,000, a portion of the proceeds to be used for extensions and improvements.

Fire, June 19, destroyed a portion of the plant of the Allegheny Plate Glass Co., Glassmere, near Tarentum, Pa., with loss estimated at about $50,000, including equipment.

The West Penn Co., West Penn Building, Pittsburgh, formerly known as the West Penn Traction & Water Power Co., is disposing of a bond issue of $2,500,000, a portion of the proceeds to be used for extensions and improvements, including the purchase of the property of the Monongahela Power & Railway Co., West Virginia, and extensions in this system.

The Walling Co., 518 Washington Street, Johnstown, Pa., is planning for the erection of a new three-story automobile service and repair building, 75 x 130 ft., on Railroad Street, estimated to cost about $150,000, including equipment.

The Crane Co., Oliver Building, Pittsburgh, with plant at Chicago, has filed plans for its new factory branch at Allegheny Avenue and Twenty-fourth Street, Pittsburgh, to cost about $60,000.

The Warren Steel Car Co., Warren, Pa., has plans under way for rebuilding the portion of its plant recently destroyed by fire, estimated to cost about $70,000.

Cincinnati

CINCINNATI, June 26.

More encouraging reports are being received from machine-tool manufacturers than has been the case recently and the slump which developed the latter part of May has given way to a moderate activity which bids fair to continue. While no particularly large orders have been placed, the number of single machines booked the past week amounted to a considerable sum in the aggregate. The Santa Fe Railroad has commenced purchasing against its recent list, local manufacturers participating in some of the lathe orders. The Burlington has issued a new list which calls for a miscellaneous lot of tools, among which approximately 20 lathes stand out. A report is current that one of the Government aviation fields at Dayton, Ohio, will shortly purchase 20 lathes and that a requisition has already been issued for the tools. An interesting feature is the receipt of orders from European countries by one manufacturer for a number of tools, the first in many months. As a whole the export trade is showing more signs of life, a number of inquiries having been received.

Some radial drill manufacturers have increased prices 12½ per cent, and while the increase is not general, the indications point strongly to all manufacturers falling into line. It is said that lathe manufacturers are also contemplating advances, and one Eastern manufacturer has announced an advance of 10 per cent. Increasing cost of materials and labor makes the advances necessary.

The Ohio Refractories Co., Portsmouth, Ohio, has been incorporated with a capitalization of $100,000, to manufacture fire brick. It has purchased the former Hayward brick plant at Ironton, Ohio, and operations are expected to commence about July 1. The works will have a capacity of 30,000 brick per day. M. K. Hitchcock is general manager.

The Y. F. Stewart Motor Car Mfg. Co., with plants at Bowling Green, Ohio, and Louisville, Ky., has taken over the former plant of the Immel Body Co., Columbus, Ohio, and will manufacture a low priced steam car to be known as the Coats steamer. It is expected that within a month the production of cars will number 10 a day. Y. F. Stewart is president and G. A. Coats vice-president and general manager.

The Middletown Mfg. Co., Middletown, Ohio, has been organized to take over the plant of the Hutchins Mfg. Co., Trenton, Ohio, and to manufacture gas appliances. H. D. Martindale is president.

Baltimore

BALTIMORE, June 26.

The Page Power Co., Luray, Va., recently organized with a capital of $300,000 to purchase and operate the Luray Light & Power Corporation, will build a new hydroelectric power plant on the Shenandoah River, about 10 miles from Luray. A dam 500 ft. long will be constructed. The initial plant will have a capacity of about 2000 hp. M. E. Roudabush is president and treasurer, and K. E. Roudabush, vice-president.

The Munn-Griffon Co., Rocky Mount, N. C., has preliminary plans under way for a new cold storage and refrigerating plant.

Charles E. Bowers, Baltimore, has acquired the plant and equipment of the American Tool & Machinery Co., Southern Avenue and Belair Road, at a receiver's sale. It consists of a two-story machine shop, with one-story exten-

sion. No official announcement has been made regarding the plans of the new owner.

The Frostburg Sewer Pipe Co., Frostburg, Md., is being organized with a capital of $200,000, to construct and operate a plant for the manufacture of clay sewer pipe. The initial works is estimated to cost close to $75,000, including machinery, power equipment, etc. The Frostburg Commercial Club, T. C. Carrington, secretary, has been instrumental in organizing the company and is interested in the project.

A vocational department will be installed in the new two-story high school, 85 x 145 ft., to be erected at Weeksville, N. C., estimated to cost about $100,000. Frank B. Simpson, Raleigh, N. C., is architect.

The Hilgartner Marble Co., Sharp and Ostend streets, Baltimore, will erect a new one-story steel crane building, 86 x 200 ft., to replace the wooden traveling crane equipment heretofore in use.

Fire, June 16, destroyed the ice-manufacturing plant of the Lincolnton Creamery & Ice Co., Lincolnton, N. C., recently completed with new machinery, and other portions of the works, with loss estimated at about $100,000, including equipment.

The Carolina Power & Textile Co., Asheville, N. C., has made application for permission to construct five new hydroelectric power plants in Henderson and Transylvania counties. The plants will have an aggregate capacity of about 10,000 hp. and will be used primarily for textile mill service.

The United Chemical Products Co., 609 Chamber of Commerce Building, Pittsburgh, will build a new one-story plant at Buena Vista, Va., for the manufacture of fertilizer products, estimated to cost about $50,000, including mixing machinery, conveying and power equipment, etc. F. B. Deane is company engineer.

The Rocky River Power & Light Co., High Point, N. C., is completing plans for a new hydroelectric generating plant on the Rocky River, near Cumnock, N. C. A transmission line will also be built. A second unit will be installed closely following the completion of the initial plant. Mees & Mees, Kinney Building, Charlotte, N. C., are engineers.

The Purchasing Agent, Post Office Department, Washington, D. C., will receive bids until July 5, for 4000 sets of commutator wire assemblies.

The Newport News & Hampton Railway, Gas & Electric Co., Newport News, Va., is disposing of a preferred stock issue of $1,200,000, a portion of the proceeds to be used for electric plant extensions and improvements, etc. J. N. Shannahan is president.

The Elliott Motor Co., Suffolk, Va., has completed plans for the erection of a five-story automobile service and repair building at Norfolk, Va., 60 x 78 ft., estimated to cost about $65,000.

The Big Bend Power Co., Scottsville, Va., has commissioned the Ambler Engineering Co., Richmond, Va., to prepare plans for its proposed new hydroelectric generating plant on the James River, to have an initial capacity of 100,000 hp., and estimated to cost close to $600,000, including equipment.

W. H. Clark, Stuart, Va., machinery dealer, is in the market for electrical equipment and other power apparatus, including a 75 to 100 k.v.a. alternator, exciter, switchboard, etc., complete; 30 to 50 k.v.a. alternator; transformers, 40 hp. crude oil engine, and water wheel, with capacity of 2000 to 3000 cu. ft. of water per min.

A vocational department will be installed in the new high school to be erected at Marion, N. C., for which bids are being asked until July 10. Earle G. Stillwell, Hendersonville, N. C., is architect.

The Atlanta Army Stores, Inc., 1-35 Grant Street, Atlanta, Ga., is in the market for complete equipment for a foundry for the manufacture of sash weights. It has a capacity of about 20 tons per day.

Milwaukee

MILWAUKEE, June 26.

The machine-tool business is making substantial headway in volume and number of buyers, although single tools or small lot purchases characterize the business. The prospect that prices are on the upgrade and that on and after July 1 announcements are expected from numerous manufacturing interests that prices are marked up to meet production cost has stimulated inquiry appreciably the past week. Milling machines have made excellent progress the past month, due largely to the heavily increased activity of automotive industries. Output of millers is now the largest in more than two years, although yet considerably below the high water mark. Crane manufacturers are getting good inquiry and making more sales and structural shops are experiencing the busiest period in more than a year. Foundry operations are gradually nearing normal, with some gray iron shops working above regular schedules. The general iron, steel and machinery situation as the first half of 1922 comes to a close is regarded as more satisfactory than at any time since 1920.

The Federal Rubber Co., Cudahy, suburb of Milwaukee, contemplates the erection of a number of extensions, which also will involve enlargement of its machine shops, power plant, etc. Details are not yet available. Arthur A. Frank is general manager.

The Sundby Battery Co., an Eastern concern engaged in the manufacture of storage batteries, has purchased the plant of the former A. C. Holtz Chemical Co., on Cedarburg Road, Milwaukee, and is transferring its entire operation and headquarters to this city. The plant is of brick and steel and was completed a year ago, but never was operated by the Holtz company. The Sundby company expects to get into primary production by July 1.

The Milwaukee Sewerage Commission, City Hall, Milwaukee, is asking bids for a 20-ton 3-motor electric traveling crane, with a 63-ft. span, for the power plant to be erected immediately as part of the Jones Island sewage disposal plant project. T. C. Hatton is chief engineer of the commission.

The Superior Enameling Co., Milwaukee, has been organized with a capital stock of $40,000 to manufacture metal products, principally enameled articles. The incorporators are Rudolph F. Shaw, 1140 National Avenue; Ernst C. Shaw, 1273 Scott Street, and Anton Endler, 378 Twenty-third Avenue. A factory at Twenty-second and Clybourn streets has been leased and will be equipped for stamping, pressing and enameling processes.

The Oshkosh, Wis., Cylinder Grinding Co. has been incorporated with $10,000 capital stock to engage in the machine shop business, specializing in automotive and engine repairs. A building will be equipped immediately. The incorporators are C. G. Nebel and John Robl of Oshkosh, and O. A. Keller, Omro, Wis., all of whom will be active in the business.

The S. Miller Fruit & Cold Storage Co., Marshfield, Wis., has purchased a site at Thayer and Philips streets, Rhinelander, Wis., for its new branch warehouse and cold storage plant, to be erected at an estimated cost of $150,000. Contracts for excavation have been let and construction bids are now being taken. S. Miller, Sr., is president.

The Massey Shipbuilding Co., Superior, Wis., has been organized by Chester Massey, formerly associated with the Globe Shipbuilding Co., Superior, which during the war moved its base of operations to the Atlantic seaboard. The former Globe yard in Superior has been taken over by the new concern, which also has acquired the machinery and equipment of the Eastern yard for installation in the local plant. This will be supplemented with the purchase of some new and used tools. It is expected that the new yard will be ready to start work July 10 or 15.

Frank J. Albright, LaPointe, Madeline Island, Bayfield, Wis., has plans for a garage and repairshop, 45 x 95 ft., which will be the first shop of this kind on the island, one of the largest of the Apostle Isles in Lake Superior. Mr. Albright is Ford dealer and also will provide service for tractor, marine and other engines.

The Milwaukee Board of Industrial Education, Seventh and Prairie streets, is asking bids for furnishing and installing 2000 steel lockers in the new Central Continuation School. Archie O. Muehl is secretary.

The Wisconsin-Minnesota Light & Power Co., Eau Claire, Wis., a subsidiary of the American Public Utilities Co., Grand Rapids, Mich., has announced its intention to immediately resume construction work on a 14,000-hp. hydroelectric power plant project at Jim Falls, near Chippewa Falls, Wis. The dam will be completed and work undertaken on the power plant, 40 x 300 ft., to be equipped with three turbo-generator units. The general contract for construction has been let to the James O. Heyworth Co., Chicago.

The Kennedy Dairy Co., Madison, Wis., which is starting work on a new dairy products and ice cream plant costing $150,000 at 618-622 Union Avenue, is in the market for boilers, engines, refrigerating unit, etc. Edward Tough, Madison, is architect and engineer.

The Britton Cooperage Co., Green Bay, Wis., has been incorporated with a capital stock of $100,000 to manufacture barrels, tubs, staves, hoops, etc. The incorporators are Joseph L. Hoslet, John T. Nugent and Christian Hochgreve, all of Green Bay.

The Eau Claire, Wis., Egg & Poultry Co., 209 South River Street, has let contracts for the erection of a two-story brick and concrete cold storage warehouse, 52 x 132 x 112 ft., and will buy power plant and refrigerating equipment. A. Larson & Co., local, are general contractors.

The G. R. & S. Motor Co., Green Bay, Wis., will build a garage and machine shop costing about $20,000 on Washing-

ton Street. It will be 30 x 120 ft., part two stories and basement.

The D. J. Murray Mfg. Co., Wausau, Wis., founder, machinist and maufacturer of logging and sawmill machinery, has let the general contract to the Wisconsin Engineering & Construction Co., local, for a one-story brick and steel machine shop addition, 60 x 228 ft. Figures are being taken on additional tools and equipment. E. C. Hall, 1316 Majestic Building, Milwaukee, is designing and contracting engineer.

The Sixth Street Garage Co., Milwaukee, through M. Tullgren & Sons, architects, 425 East Water Street, awarded the general contract to S. M. Siesel & Co., 105 Wells Street, for a six-story garage, 102 x 150 ft., on Sixth Street. to cost about $200,000 complete.

The Claybourn Process Corporation, Milwaukee, has broken ground for its new works on Humboldt Avenue to cost $150,000 and be equipped for the manufacture of multicolor printing presses. It will consist of a main building, 115 x 200 ft. The general contractor is Paul Riesen's Sons Co., 1018 Humboldt Avenue, local. A heat treating building, including power plant and boiler room, 100 x 115 ft., and an administration building and stockroom, 80 x 115 ft., will be erected later. The work is in charge of Herman J. Esser, architect, 82 Wisconsin Street.

The Valley Paper Mills, Inc., Neenah, Wis., an $800,000 corporation organized a year ago, expects to let contracts July 1 through Edward A. Wettengel, architect, Appleton. Wis., for a new mill and power plant costing about $600,000. The main building will be 80 x 660 ft., two and three stories. G. W. Burnside is secretary and manager.

The Jaeger-Wheeler Co., Neenah, Wis., a consolidation of the Valley Inn Garage and the Wheeler Garage, will start work at once on a new garage, sales and service building costing $40,000, and equipped especially for Ford, Fordson and Lincoln repairs and maintenance. It is to be ready Aug. 15 or Sept. 1.

The Bahde Mfg. Co., Milwaukee, has been incorporated with $50,000 capital to manufacture patented mechanical devices and appliances on a royalty basis for inventors, and will build a machine shop costing about $30,000 at Thirtieth and Chambers streets. Officers are: President, Carl A. H. Bahde; vice-president, William C. Dittman; secretary, L. L. Suschel; treasurer, Valentine Zillig.

Martin Froehlig, 779 Sixth Street, Milwaukee, has plans by Philip E. Schaefer, architect, 401 Fourth Street, for a public garage, sales and service building, 50 x 127 ft., part two stories and basement, to be erected at Twenty-ninth and Center streets. The estimated investment will be $27,500.

Buffalo

BUFFALO, June 26

The United States Light & Heat Corporation, Niagara Falls, N. Y., manufacturer of electric batteries, lighting and power equipment, will establish a new branch plant at Oakland, Cal., for Pacific Coast trade. A site for the works has been acquired.

A vocational department will be installed in the three-story high school to be erected at 2643 Main Street, Buffalo, estimated to cost about $1,500,000. Bids will be asked early in August. The Associated Buffalo Architects, 40 Delaware Court Building, are preparing plans.

The Ellicott Motor Service Co., 19 Wells Street, Buffalo, is arranging for the installation of machine tools and other machine shop equipment in its repair department.

Henry Ford, Detroit, is reported to be planning for the purchase of property at Carolina and Fourth streets, Buffalo, to be used as an Eastern plant for the Lincoln Motor Co., an affiliated interest.

Harry N. Kraft, 26 Summit Avenue, Buffalo, has been granted permission by the City Council to raze the buildings at South Elmwood Avenue and Mohawk Street for the erection of an eight-story automobile service, repair and storage building, 165 x 235 ft., estimated to cost about $750,000, including equipment. Plans are being prepared.

A one-story power house, 26 x 55 ft., will be constructed by the Niagara Linen Supply Co., Buffalo, at its plant at 353 Louisiana Street.

The City Commission, Buffalo, will receive bids until July 11, for the erection of the first unit of the municipal filtration plant, including pumping station, equipment, etc., estimated to cost in excess of $300,000. The Bureau of Water, Commissioner Kreinheder, is in charge. Fuller & McClintock, 170 Broadway, New York, are consulting engineers.

The Board of Education, 1401 Telephone Building, Buffalo, will receive bids until July 5 for equipment for the vocational department at School No. 66, Ontario and Saratoga streets. The Associated Buffalo Architects, 40 Delaware Court Building, have prepared plans.

The Swan Garage, Inc., East Swan Street, Buffalo, has plans under way for a new three-story service and repair building, 90 x 115 ft., estimated to cost about $50,000. C. J. Irwin is president.

The Retsof Mining Co., Retsof, N. Y., has awarded contract to the John W. Cowper Co., Fidelity Building, Buffalo, for a one and two-story salt mining and refining plant, estimated to cost about $1,000,000, including machinery, power house, etc. T. F. Courthope, Retsof, is company engineer.

The Bolivar Foundry Co., Bolivar, N. Y., recently organized, is arranging for the establishment of a local foundry for the manufacture of castings. The company is capitalized at $50,000. W. J. Brannen is president.

Fire, June 20, destroyed the rossing mill of the St. Regis Paper Co., Carthage, N. Y., with loss estimated at about $40,000, including equipment.

The Probst Sheet Metal & Roofing Co., 220 East Second Street, Jamestown, N. Y., is arranging for the installation of equipment in its plant.

The Rome Wire Co., Railroad Street, Rome, N. Y., manufacturer of electrical wire products, has acquired the plant and equipment of the Toledo Enameled Wire Products Co., Toledo, Ohio. The Toledo works will be discontinued and the machinery removed to Rome for installation at the local plant, where combined operations will be concentrated.

The Union Iron Works, Fifteenth and Cascade streets, Erie, Pa., has taken bids for a new one, two and three-story plant, 160 x 300 ft., to replace its works destroyed by fire several months ago. G. W. Bach is general manager.

The American Woodworking Machinery Co., Rochester, N. Y., will build a foundry addition at its plant to cost about $18,000. The foundation and steel frame were erected in 1920, and the building will now be completed. It will be 110 x 130 ft.

McKaig-Hatch, Inc., 1534 Niagara Street, Buffalo, manufacturer of forgings and pliers, is building a new plant at Skillen and Ontario streets. C. R. Hatch is secretary and treasurer.

The Gulf States

BIRMINGHAM, June 26.

The Tennessee Coal, Iron & Railroad Co., Birmingham, is considering plans for a new one-story foundry at Ensley.

The Common Council, Kaufman, Tex., has tentative plans under consideration for a municipal electric light and power plant.

The Ouachita Natural Gas Co., Swartz, La., is planning for the construction of a new 6-in. pipe line to Sterlington, La., about 10 miles, including compressor plants and other operating equipment, estimated to cost approximately $60,000.

The Standard Spring & Axle Co., Dallas, Tex., has purchased the plant of the Carlton Auto Spring Co., 2814 Main Street, and will operate at this location; production to include the manufacture of steel springs of all kinds, as well as automobile parts. L. K. Weaver and Thomas P. Steger head the company.

The Common Council, Homestead, Fla., will take bids until about July 10 for electrical equipment for its proposed municipal power plant, estimated to cost about $50,000.

The Swiftsure Oil Co., Texas City, Tex., will make extensions and improvements in its local plant, including the installation of pumping and other machinery.

The Common Council, Timpson, Tex., will commence the immediate construction of a municipal electric light and power plant.

The Chickasaw Shipbuilding & Car Co., Fairfield, Ala., a subsidiary of the Tennessee Coal, Iron & Railroad Co., Birmingham, has preliminary plans under way for extensions, to include the erection of a new one-story steel foundry.

The City Council, Dothan, Ala., will take bids until Aug. 15 for the construction of hydroelectric generating plant at High Bluff, on the Choctawhatchee River, to include turbines, electric generators, transformers and auxiliary power plant equipment for two units, with total capacity of about 3000 hp.; also for a 21½-mile transmission line to operate at 44,000 volts. The Ludlow Engineers, Inc., Winston-Salem, N. C., are in charge.

W. A. MacDuff, Jacksonville, Fla., is having plans prepared for a one-story automobile service and repair building, 105 x 110 ft., on Monroe Street, estimated to cost about $35,000. Greeley & Benjamin, Jacksonville, are architects.

The Texhoma Oil & Refining Co., Wichita Falls, Tex.,

has acquired the local refinery of the Bankers' Refining Co. Operations will be placed under way at once, with plans to increase the capacity to 4000 bbl. a day.

The Common Council, Brownfield, Tex., has approved plans for the construction of a municipal electric light and power plant. Bonds will be voted on July 21.

The Co-Ops Ice & Cold Storage Co., Lozano and Constant streets, Tampa, Fla., has tentative plans for rebuilding its ice-manufacturing and cold storage plant recently destroyed by fire with loss estimated at about $100,000, including machinery.

The Johnson-Anthony Supply Co., 216 Browder street, Dallas, Tex., has preliminary plans under way for the establishment of an assembling plant for gasoline pumps, air compressors, tanks, etc. W. N. Johnson is president.

The Breckenridge Ice & Storage Co., Breckenridge, Tex., is planning for extensions and improvements in its ice-manufacturing plant to cost about $15,000. New equipment will be installed.

The Western Gear & Parts Co., Dallas, Tex., manufacturer of automobile transmissions and parts, has arranged for the establishment of a factory branch at 111 Belknap street, Fort Worth, Tex., in charge of J. S. Connell. The Dallas plant has recently removed to larger quarters and is in charge of W. B. Connell.

The Post Office Department, Washington, is arranging to lease property at Dallas, Tex., for extensions in the local automobile service and repair works used for Government motor trucks and cars in this section. New machine tools and other equipment will be installed. The plant will be used to repair all cars in the Texas, Oklahoma and part of Louisiana territory.

The Acme Sand Co., Eustis, Fla., is planning for the installation of a new oil engine, pumping machinery and other equipment. L. D. Wylly is general manager.

The Central South

ST. LOUIS, June 27.

The Broderick & Bascom Rope Co. will build a new wire rope manufacturing plant in St. Louis to cost $250,000, exclusive of equipment, as soon as a suitable site is decided upon. It will consist of two units, the factory proper and parallel to this building and separated by an open space, another unit including the office building, warehouses for raw and finished materials, spooling and testing departments, machine shop, blacksmith shop, engine room and boiler house. All excepting the boiler house are under one roof. Each of the two units will be 600 ft. long. The factory will be 143 ft. wide, the other group 83 ft. wide. Both units will have brick walls and concrete roofs and floors. The roofs will be supported by steel trusses. In addition, the factory will have concrete foundations to support the great weight of the "laying up" and "stranding" machinery.

The Century Electric Co., 1827 Pine Street, St. Louis, manufacturer of motors, fans, etc., will soon take bids for an addition to its plant at 113 North Eighteenth Street, including improvements in the present factory, estimated to cost about $100,000 with equipment. L. B. Pendleton, DeMenil Building, is architect. E. S. Pillsbury is president.

The Kansas Electric Power Co., Leavenworth, Kan., is disposing of a bond issue of $3,000,000, a portion of the proceeds to be used for extensions and improvements in plants and system.

The Field Packing Co., Louisville, has preliminary plans under way for a new one-story cold storage and refrigerating plant.

The Mains-Haskins Coal Co., Blue Diamond, Ky., is planning for the construction of a new tipple at Typo, Ky., estimated to cost close to $50,000. A. Haskins is general manager.

The Board of Directors, Unity School of Christianity, Ninth and Tracy avenues, Kansas City, Mo., will build a new machine shop and power house at the institution, estimated to cost about $50,000. Elmer Boillott, 1202 Scarritt Building, is architect.

E. T. Archer & Co., 609 New England Building, Kansas City, Mo., consulting engineers, have plans in preparation for electrically-operated pumping plants at Hartford and Robinson, Kan., to be installed in connection with new waterworks plants at each place.

The Hudson Hardwood Flooring Co., Memphis, Tenn., a subsidiary of the Hudson & Dugger Co., Memphis, will commence the immediate erection of a new plant comprising two units, with total capacity of about 35,000 ft. per day. With machinery it will cost in excess of $80,000.

R. H. Harris & Son, Ada, Okla., have preliminary plans under way for the erection of a new brick manufacturing plant at Ardmore, Okla., with capacity of about 20,000 brick per day. A power house will be constructed.

The Kansas-Texas Oil Co., Wichita, Kan., has acquired the local oil refinery of the Derby Oil Co., for about $100,000. Possession will be taken July 1, at which time the Derby company will commence production at a new refinery in this field, now being completed. The Kansas-Texas company plans extensions and improvements in the present plant, which now has a capacity of about 1800 bbl. daily.

A two-story power house, 36 x 50 ft., will be constructed at the convent of the Little Sisters of the Poor, 3400 South Grand Avenue, St. Louis. Lee & Rusch, Syndicate Trust Building, are architects in charge.

The Springfield Gas & Electric Co., Springfield, Mo., will soon break ground for a new electric generating plant at Phelps and Main avenues, estimated to cost about $1,000,000, including machinery. Sanderson & Porter, 52 William Street, New York, are consulting engineers.

The Wichita Pattern Works, 117 West English Street, Wichita, Kan., is planning for the installation of a lathe, emery stand, and other equipment. B. F. Croney heads the company.

A one-story cold storage and refrigerating plant to cost about $25,000, will be constructed by the Missouri Valley Creamery Co., Washington, Mo. Plans are being completed.

A vocational department will be installed in the two-story and basement high school, 120 x 156 ft., to be erected at Colby, Kan., estimated to cost $130,000. Bids on a general contract have been asked by Mann & Gerow, Rorabaugh-Wiley Building, Hutchinson, Kan.

The Missouri Portland Cement Co., Chouteau and Rankin streets, St. Louis, has arranged for a bond issue of $2,000,000, a portion of the proceeds to be used for plant extensions and betterments.

The City Clerk, Wilburton, Okla., will receive bids until July 10 for waterworks extensions, including the following equipment: Two 500-gal. per min., motor-driven, low service centrifugal pumping units installed complete; one 500-gal. per min. high service centrifugal pump reset complete; one 350-gal. per min. high service pumping unit, installed complete with connections; one 150-hp. oil engine generator set, complete with switchboard, etc., and power house extensions. V. V. Long & Co., 1200 Colcord Building, Oklahoma City, Okla., are engineers.

The Moore Refining Co., Arkansas City, Kan., recently organized to take over and operate the local refinery of the Milliken Refining Co., is planning for enlargements to increase the capacity from 2500 bbl. to 6000 bbl. per day. The work is estimated to cost in excess of $500,000, with machinery. George N. Moore, formerly head of the Shaffer Oil & Refining Co., Chicago, is president.

The United States Engineers, District No. 2, room 513, Government Building, Cincinnati, will take bids early in July for the construction of a two-story power plant on the Ohio River, dam No. 30, near Greenup, Ky., estimated to cost about $50,000.

Indiana

INDIANAPOLIS, June 26.

The Fort Wayne Tank & Pump Co., Fort Wayne, Ind., has awarded contract to the Austin Co., 208 South La Salle Street, Chicago, for a one-story addition, 120 x 240 ft., estimated to cost about $75,000. The contractor is completing plans.

The Indiana & Michigan Electric Co., South Bend, Ind., has acquired the Benton Harbor-St. Joseph Railway & Lighting Co., Benton Harbor, Mich., and will make extensions and improvements in the plant and system. Plans are under way for the erection of a hydroelectric power house on the St. Joseph River, estimated to cost in excess of $1,000,000.

The Majestic Tire & Rubber Co., Indianapolis, has acquired a portion of the plant at Cruse and Daly streets and will remodel the building for new works.

The Bertsch Co., Cambridge City, Ind., manufacturer of sheet-metal machinery, punches, shears, etc., is completing plans for a one-story addition, 30 x 100 ft. C. E. Werking & Son, Palladium Building, Richmond, Ind., are architects.

The Simplex Lock Rim Co., Petersburg, Ind., will build an addition to its plant, 30 x 70 ft., to manufacture metal rims for automobile wheels.

The Bippus Clay Products Co., Goshen, Ind., has been organized to take over and operate the Bippus Tile Co., with plant near Bippus, Huntington County. The new company is capitalized at $55,000 and has acquired 36 additional acres in the vicinity of the works. Extensions and improvements will be made and operations soon resumed for the manufacture of tile and kindred products. H. V. D. King, Goshen, heads the new company.

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Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

	Per Lb.
Bars:	
Refined iron bars, base price	2.58c.
Swedish bars, base price	7.00c.
Soft steel bars, base price	2.58c.
Hoops, base price	3.63c.
Bands, base price	3.23c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	2.68c.
Channels, angles and tees under 3 in. x ¼ in., base	2.58c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	2.60c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	2.80c.
Toe-calk, ½ x ⅝ in. and larger	3.40c.
Cold-rolled strip, soft and quarter hard	6.25c. to 7.25c.
Open-hearth spring steel	3.50c. to 6c.
Shafting and Screw Stock:	
Rounds	3.35c.
Squares, flats and hex	3.85c.
Standard cast steel, base price	12.00c.
Extra cast steel	17.00c.
Special cast steel	22.00c.

Tank Plates—Steel

¼ in. and heavier	2.68c.

Sheets

Blue Annealed

	Per Lb.
No. 10	3.48c. to 3.63c.
No. 12	3.53c. to 3.68c.
No. 14	3.58c. to 3.73c.
No. 16	3.63c. to 3.83c.

Box Annealed—Black

	Soft Steel C. R., One Pass, Per Lb.	Blued Stove Pipe Sheet, Per Lb.
Nos. 18 to 20	4.00c. to 4.30c.	.....
Nos. 22 and 24	4.05c. to 4.35c.	4.60c.
No. 26	4.10c. to 4.40c.	4.65c.
No. 28	4.20c. to 4.50c.	4.75c.
No. 30	4.45c. to 4.75c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher.

Galvanized

	Per Lb.
No. 14	4.30c. to 4.60c.
No. 16	4.45c. to 4.75c.
Nos. 18 and 20	4.60c. to 4.90c.
Nos. 22 and 24	4.75c. to 5.05c.
No. 26	4.90c. to 5.20c.
No. 27	5.05c. to 5.35c.
No. 28	5.20c. to 5.50c.
No. 30	5.70c. to 6.00c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
½ in. Butt..	—56	—40	¾ in. Butt..	—30	—13
¾ in. Butt..	—61	—47	1½ in. Butt..	—32	—15
1-3 in. Butt..	—63	—49	2 in. Lap....	—27	—10
3½-6 in. Lap.	—60	—46	2½-6 in. Lap.	—30	—15
7-8 in. Lap..	—56	—34	7-12 in. Lap..	—23	— 7
9-12 in. Lap.	—55	—33			

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	3.50c. to 3.75c.
Annealed soft	3.50c. to 3.75c.
Galvanized annealed	4.25c. to 4.50c.
Coppered basic	4.00c. to 4.25c.
Tinned soft Bessemer	5.50c. to 5.75c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	16¾c. to 17¼c.
High brass wire	17¼c. to 17¾c.
Brass rod	14¾c. to 15¾c.
Brass tube, brazed	23¾c. to 24½c.
Brass tube, seamless	20 c. to 20½c.
Copper tube, seamless	22¼c. to 23¼c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 20¾c. to 21¾c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14-20		
	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20		Primes	Wasters
			80 lb..	$6.05	$5.80
			90 lb..	6.15	5.90
			100 lb..	6.25	6.00
IC..	$10.00	$8.50	IC..	6.40	6.15
IX..	11.50	10.00	IX..	7.40	7.15
IXX..	13.00	11.25	IXX..	8.40	8.15
IXXX..	14.25	12.50	IXXX..	9.40	9.15
IXXXX..	16.00	14.00	IXXXX..	10.40	10.15

Terne Plates

8-lb. coating, 14 x 20

100 lb.	$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

Tin

Straits, pig	33½c.
Bar	40c. to 44c.

Copper

Lake ingot	15¼c.
Electrolytic	15 c.
Casting	14¾c.

Spelter and Sheet Zinc

Western spelter	6¾c. to 7c.
Sheet zinc, No. 9 base, casks	8½c. open 9c.

Lead and Solder*

American pig lead	6¾c. to 7c.
Bar lead	8c. to 8½c.
Solder, ½ and ½ guaranteed	25c.
No. 1 solder	23½c.
Refined solder	20¼c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	75c.
Commercial grade, per lb	35c.
Grade D, per lb	25c.

Antimony

Asiatic	6½c. to 7c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb	25c. to 27c.

Old Metals

The market is firmer and prices show a tendency to be higher. Dealers' buying prices are nominally as follows:

	Cents Per Lb.
Copper, heavy crucible	11.75
Copper, heavy wire	11.25
Copper, light and bottoms	9.00
Brass, heavy	6.00
Brass, light	5.00
Heavy machine composition	8.50
No. 1 yellow brass turnings	6.25
No. 1 red brass or composition turnings	7.75
Lead, heavy	4.50
Lead, tea	3.25
Zinc	2.75

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